INDEPENDENT ORBITER ASSESSMENT

ASSESSMENT OF THE
MAIN PROPULSION
SUBSYSTEM
FMEA/CIL
VOLUME 1 OF 4

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MCDONNELL DOUGLAS ASTRONAUTICS COMPANY ENGINEERING SERVICES

SPACE TRANSPORTATION SYSTEM ENGINEERING AND OPERATIONS SUPPORT

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INDEPENDENT ORBITER ASSESSMENT ASSESSMENT OF THE ORBITER MAIN PROPULSION SYSTEM FMEA/CIL

26 February 1988

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CONTENTS

		CONTENIS	<u>Page</u>
1.0	EXEC	UTIVE SUMMARY	1
2.0	INTR	ODUCTION	4
		Purpose	4 4
	2 3	Scope Analysis Approach Orbiter Ground Rules and Assumptions	4 5
3.0		SYSTEM DESCRIPTION	6
	3.1	Design and Function	6
		3.1.1 Propellant Management Subsystem Function	6
		3.1.2 The PMS Components	6
		A. Liquid Propellant Supply and	6
		Distribution Network B. Gaseous Propellant Collection and	14
		Supply Network	15
		C. Valves 3.1.3 Orbiter MPS - Helium Subsystem General Description	17
		a	17
		3.1.4 Helium Subsystem Components A. Supply Tank	17
		B. Valves	21
		C. Supply Tank Isolation Valves	21
		n. Interconnect Valves	21
		F Manifold Pressurization Valves	22
		F. LH2 RTLS Pump Pressurization Valves	22
		G. Pressure Regulators	23
		H. Relief Valves	23
	3.2	Interfaces and Locations	23
	3.3	Hierarchy	23
4.0) ASS	SESSMENT RESULTS	
	4.1 4.2	Mechanical Components Electrical/Electronic Components	
5.0	REF	FERENCES	

	<u>Page</u>
APPENDIX A Acronyms	A-1
APPENDIX B DEFINITIONS, GROUND RULES, AND ASSUMPTIONS	B-1
B.1 Definitions B.2 Project Level Ground Rules and Assumptions	B-2
B.3 Subsystem Specific Ground Rules and Assumptions	B-4 B-6
APPENDIX C ASSESSMENT WORKSHEETS	C-1
APPENDIX D CRITICAL ITEMS	D-1
APPENDIX E ANALYSIS WORKSHEETS	E-1
APPENDIX F NASA FMEA TO IOA WORKSHEET CROSS REFERENCE/RECOMMENDATIONS	F-1
List of Figures	
	<u>Page</u>
Figure 1 - ORBITER MPS OVERVIEW ANALYSIS SUMMARY Figure 2A - ORBITER MPS SUBSYSTEM	2
	7
2B - ORBITER MPS LO2 OVERVIEW	8
2C - ORBITER MPS LH2 SUBSYSTEM OVERVIEW 2D - ORBITER MPS HELIUM SUBSYSTEM OVERVIEW	9
Figure 3 - PROPELLANT MANAGEMENT SUBSYSTEM	10
OXIDIZER FLOW	11
Figure 4 - PROPELLANT MANAGEMENT SUBSYSTEM FUEL FLOW	• •
Figure 5 - HELIUM SUBSYSTEM; STORAGE AND REGULATION	12
Figure 6A - PNEUMATIC HELIUM DISTRIBUTION	18 19
Figure 6B - PNEUMATIC HELIUM DISTRIBUTION (CONCLUDED)	20
	20
List of Tables	
	<u>Page</u>
Table I - SUMMARY OF IOA FMEA ASSESSMENT	
Table II - SUMMARY OF IOA CIL ASSESSMENT	
Table III- SUMMARY OF IOA RECOMMENDED FAILURE CRITICALITIES	
Table IV - SUMMARY OF IOA RECOMMENDED CRITICAL ITEMS	
Table V - IOA WORKSHEET NUMBERS	

Independent Orbiter Assessment
Assessment of the Orbiter Main Propulsion System FMEA/CIL

1.0 EXECUTIVE SUMMARY

The McDonnell Douglas Astronautics Company (MDAC) was selected in June 1986 to perform an Independent Orbiter Assessment (IOA) of the Failure Modes and Effects Analysis (FMEA) and Critical Items List (CIL). Direction was given by the STS Orbiter and GFE Projects Office to perform the hardware analysis using the instructions and ground rules defined in NSTS 22206, Instructions for Preparation of FMEA and CIL, 10 October 1986.

The IOA effort first completed an analysis of the Main Propulsion System (MPS) hardware, generating draft failure modes and potential critical items. To preserve independence, this analysis was accomplished without reliance upon the results contained within the NASA FMEA/CIL documentation. The IOA results were then compared to available data from the Rockwell Downey/NASA JSC (henceforth referred to as RI/NASA) FMEA/CIL review. (This review is still in progress as of this writing.) Data available to IOA as of 1 January 1988 was used.

For the mechanical component analysis, this included: (1) The RI/NASA Critical Items List of 23 December 1987, (2) substantially complete (but still subject to revision) CIL worksheets for the Feed and Fill/Drain Subsystems, and (3) RI/NASA FMEA/CIL review meeting notes specifying revisions to the pre-51L FMEA/CIL document. These notes were acquired from J. E.Borches/Lockheed in July 1987.

Available data for the EPD&C analysis included substantially complete CIL worksheets for some EPD&C components (Feed and Fill/Drain) and the MPS/EPDC FMEA Review Summary of 18 August 1987. The Review Summary gives no supporting information, only criticalities and screens. All of this data was still subject to change at the time this assessment began.

IOA Assessment sheets (Appendix C) indicate the source of the RI/NASA work that was assessed. Where no source is given, an RI/NASA CIL worksheet was used.

Due to severe budget and schedule constraints, the resolution of differences between the RI/NASA results and IOA was not possible.

An overview of the IOA MPS Assessment results is given in Figure 1.

MPS ASSESSMENT OVERVIEW

MPS	ASSES	SMENT S	UMMARY
	IOA	NASA	ISSUES
FMEA	1365	1264	399
CIL	711	749	191

MECHANICAL COMPONENTS					
	ЮА	NASA	ISSUES		
FMEA	623	606	179		
CIL	410	475	86		

ELECTRICAL COMPONENTS					
	ЮА	NASA	ISSUES		
FMEA	742	658	220		
CIL	301	274	105		

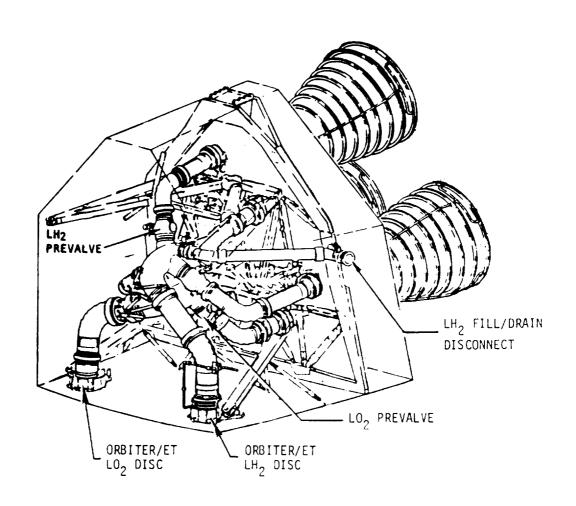


Figure 1 - MPS FMEA/CIL ASSESSMENT

INTRODUCTION 2.0

Purpose 2.1

The 51-L Challenger accident prompted the NASA to readdress safety policies, concepts, and rationale being used in the National Space Transportation System (NSTS). The NSTS Office has undertaken the task of reevaluating the FMEA/CIL for the Space Shuttle design. The MDAC is providing an independent assessment of the proposed Post 51-L Orbiter FMEA/CIL for completeness and technical accuracy.

2.2 Scope

The scope of the independent FMEA/CIL assessment activity encompasses those Shuttle Orbiter subsystems and GFE hardware identified in the Space Shuttle Independent FMEA/CIL Assessment Contractor Statement of Work. Each subsystem analysis addresses hardware, functions, internal and external interfaces, and operational requirements for all mission phases.

Analysis Approach 2.3

The independent analysis approach is a top-down analysis utilizing as-available drawings to breakdown the respective subsystem into components and low-level hardware items. Each hardware item is evaluated for failure mode, effects, and criticality. are documented in the respective subsystem analysis report, and are used to assess the proposed Post 51-L NASA and Prime Contractor FMEA/CIL. The IOA analysis approach is summarized in the following Steps 1.0 through 3.0. Step 4.0 summarizes the assessment of the NASA and Prime Contractor FMEA/CIL which is documented in this report.

- Step 1.0 Subsystem Familiarization
 - 1.1 Define subsystem functions
 - 1.2 Define subsystem components
 - Define subsystem specific ground rules and 1.3 assumptions
- Step 2.0 Define subsystem analysis diagram
 - 2.1 Define subsystem
 - 2.2 Define major assemblies
 - 2.3 Develop detailed subsystem representations
- Step 3.0 Failure events definition
 - 3.1 Construct matrix of failure modes
 - Document IOA analysis results

- Step 4.0 Compare IOA analysis data to NASA FMEA/CIL
 - 4.1 Resolve differences
 - 4.2 Review in-house
 - 4.3 Document assessment issues
 - 4.4 Forward findings to Project Manager

2.4 Ground Rules and Assumptions

The ground rules and assumptions used in the IOA are defined in Appendix B. The subsystem specific ground rules were defined to provide necessary additions and clarifications to the ground rules and assumptions contained in NSTS 22206.

3.0 SUBSYSTEM DESCRIPTION

3.1 Design and Function

The Orbiter Main Propulsion System is composed of the Propellant Management Subsystem (PMS) consisting of the LO₂ and LH₂ subsystems and the Helium Subsystem (Figures 2A thru 2D). The PMS is a system of manifolds, distribution lines, and valves by which the liquid propellants pass from the ET to the SSMEs. Some of the propellants are vaporized in the engine and returned to the ET to maintain ullage pressure. The Helium Subsystem consists of a series of helium supply tanks and their associated regulators, check valves, distribution lines, and control valves. The Helium Subsystem supplies helium that is used within the SSMEs for in-flight purges and provides pressure for actuating SSME valves during emergency pneumatic shutdowns. The balance of the helium is used to provide pressure to actuate all the pneumatically operated valves within the PMS.

3.1.1 Propellant Management Subsystem Function

During engine burn, propellants under tank pressure flow from the ET to the Orbiter through two umbilicals; one for ${\rm LO_2}$ and the other for ${\rm LH_2}$ (Figures 3 and 4, respectively).

The PMS also provides a path which allows gases tapped from the three engines to flow back to the ET, through two gas umbilicals, to maintain pressures in the fuel and oxidizer tanks.

The PMS also functions during phases other than engine burn. During prelaunch, the PMS is used to control the loading of propellants in the ET. During orbit, PMS controls propellant dump, vacuum inerting, and system repressurization (for entry).

3.1.2 The PMS Components

The PMS contains the following major components (Figures 3 and 4).

- A. Liquid Propellant Supply and Distribution Network.

 The network is composed of all the liquid propellant lines used to load propellants during prelaunch, feed propellants to the SSMEs during engine burn, and dump residual propellants after ET separation. Specifically, the network consists of:
 - 1. Propellant Feedline Manifolds There are two 17-inch diameter manifolds in the Orbiter, one for LO₂ and one for LH₂. Both of the manifolds have a feedline disconnect valve at one end and two fill and drain valves (one inboard, one outboard) connected in series at the other end. The feedline manifolds connect to the ET liquid propellant umbilicals at the feedline disconnect valve, and to either GSE liquid propellant umbilicals (prelaunch only), or overboard at the outboard fill and drain valves.

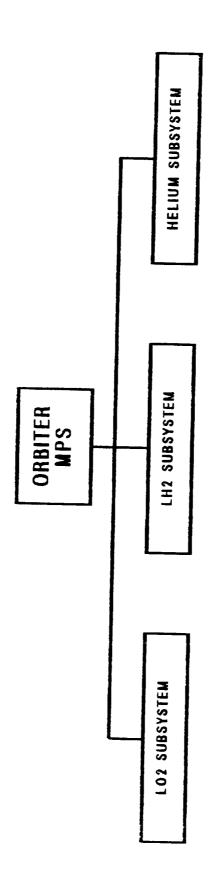


Figure 2A - ORBITER MPS SUBSYSTEMS

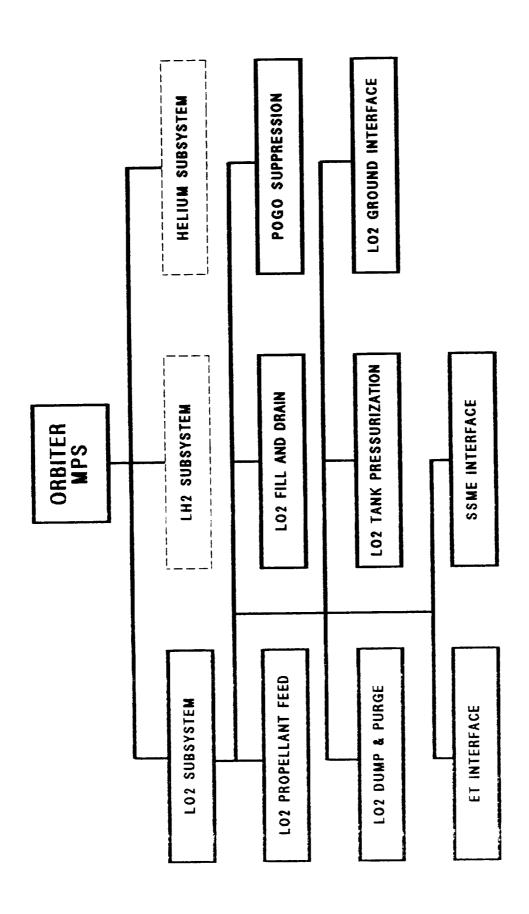


Figure 2B - ORBITER MPS LO2 SUBSYSTEM OVERVIEW

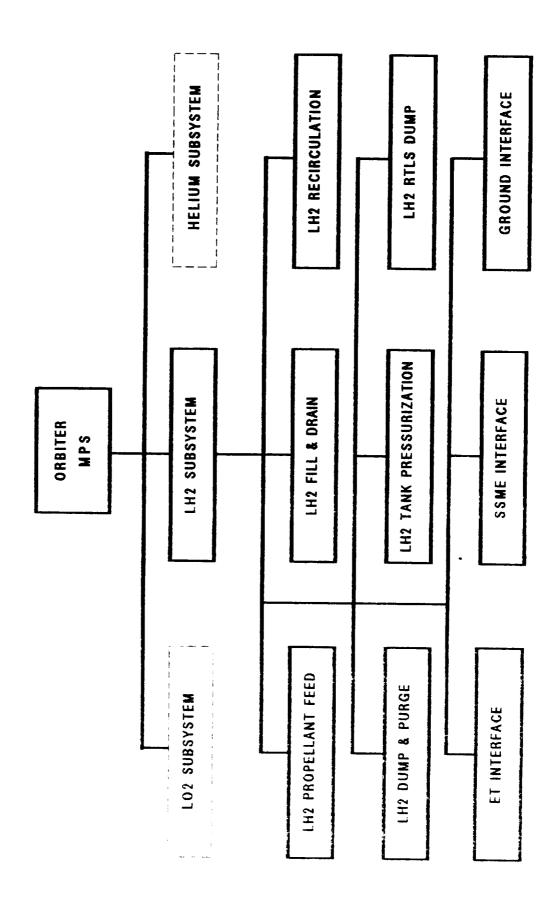


Figure 2C - ORBITER MPS LH₂ SUBSYSTEM OVERVIEW

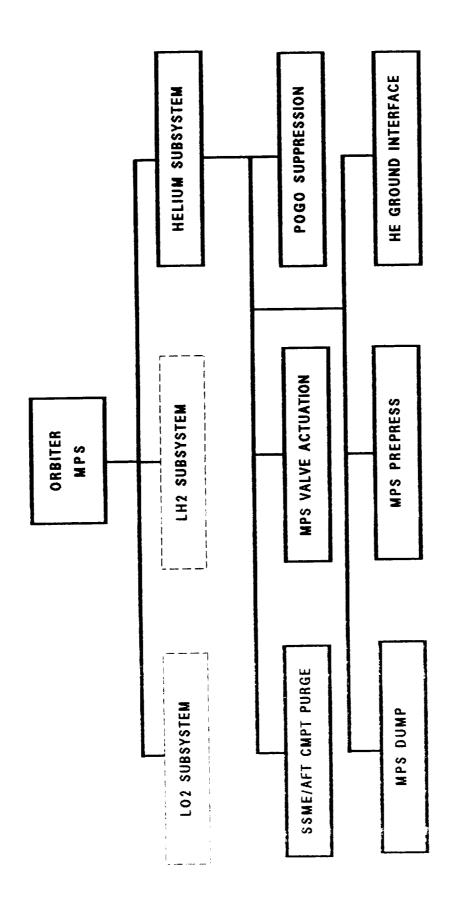


Figure 2D - ORBITER MPS HELIUM SUBSYSTEM OVERVIEW

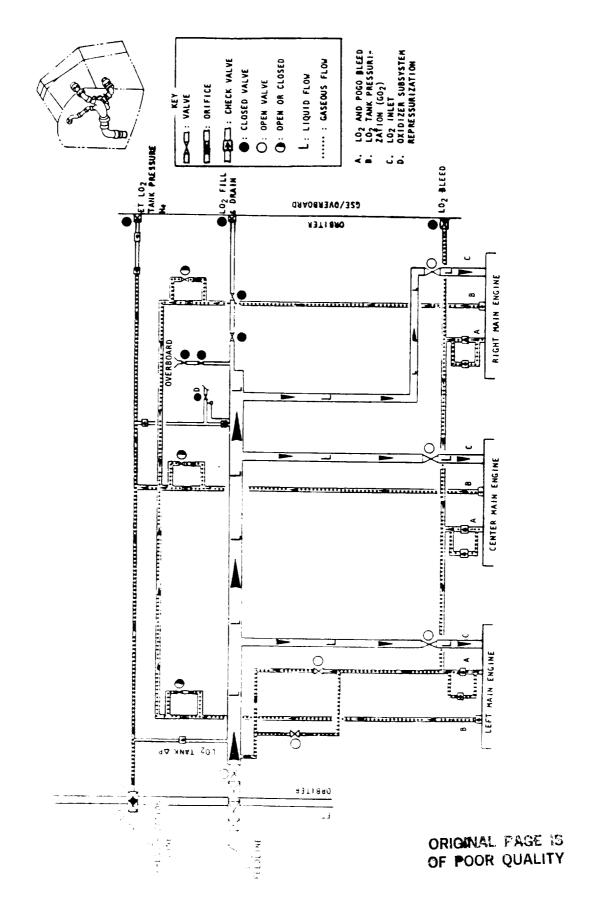


Figure 3 - PROPELLANT MANAGEMENT SUBSYSTEM OXIDIZER FLOW

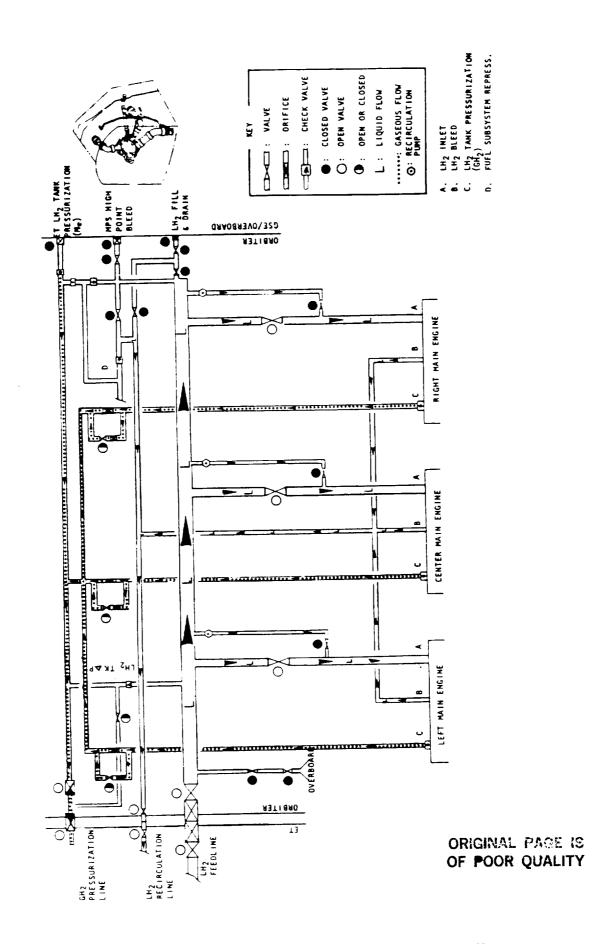


Figure 4 - PROPELLANT MANAGEMENT SUBSYSTEM FUEL FLOW

Between the feedline disconnect valves and the inboard fill and drain valves are three outlets for the three engine propellant feedlines and 1 outlet for the propellant feedline relief line. The LH₂ feedline manifold contains an extra outlet for the LH₂ Return to Launch Site (RTLS) feedline dump line. (See paragraph 4 below.) Pressures within the LO₂ and the LH₂ feedline manifolds (MANF) can be monitored on the two ENG MANF meters on Panel F7 or the CRT display Guidance and Navigation Control (GNC) System (SYS) SUMM 1 Backup Flight System (BFS).

- 2. Engine Propellant Feedlines There are 6 12-inch diameter feedlines in the Orbiter, 3 for LO₂ and 3 for LH₂. Each of the LO₂ engine propellant feedlines connects to the LO₂ feedline manifold at one end and to the Low Pressure Oxidizer Turbopump (LPOT) inlet of one of the SSMEs at the other end. Likewise, each of the LH₂ engine propellant feedlines connects to the LH₂ feedline manifold at one end and to the Low Pressure Fuel Turbopump (LPFT) inlet at one of the SSMEs at the other end. There is one prevalve in each of the six engine propellant feedlines. The prevalves are designated as left, center, or right (engine) LO₂ prevalve; or left, center, or right (engine) LH₂ prevalve.
- 3. Propellant Feedline Relief Line There are 2 1-inch diameter relief lines in the Orbiter, 1 for LO2 and 1 for LH2. Each relief line connects to 1 of the propellant feedline manifolds at 1 end and to an overboard port at the other end. Each relief line contains a relief valve and a pneumatically actuated relief isolation valve. The isolation valve is mounted in series with, and up-stream of, the relief valve. Flow through the relief line and relief valve is enabled by relieving closing pressure on the normally open isolation valve, allowing it to open.

The position of the relief isolation valve (2) is controlled by one of two FEEDLINE RLF ISOL switches on Panel R4. Normally these switches are left in the GPC position. With the switches (2) in this position, both relief isolation valves will be opened automatically immediately after MECO. The purpose of the relief lines is to prevent excessive pressure build-ups, generated by heatup and expansion of the propellants in the feedline manifolds, by allowing the pressure to be vented overboard through the relief valves.

- 4. LH₂ RTLS Feedline Dump Line This is a single 2-inch diameter line which connects to the LH₂ feedline manifold at one end and to an overboard port at the other end. (The overboard port is located on the outer skin of the left side of the Orbiter between the Orbital Maneuvering System (OMS) pod and the upper surface of the wing.) The line is used for dumping residual LH₂ during an RTLS abort. In non-RTLS situations, the pilot can use the backup LH₂ dump switch to open these valves. Flow through the line is controlled by 2 series-connected, normally closed, LH₂ RTLS dump valves (1 inboard, 1 outboard) which are mounted in the line. The LH₂ RTLS dump valves are controlled automatically by GPC commands.
- B. Gaseous Propellant Collection and Supply Network. The network consists of all the lines used to collect and supply gaseous propellants (GO2 and GH2) from all three SSMEs to the ET to maintain propellant tank pressure during main engine burn. (Note: This network has no major function after ET separation.) Specifically, the gaseous propellant collection and supply network consists of the following.
 - 1. Engine ET Pressurization Output Lines There are 6 0.63-inch diameter pressurization lines in the Orbiter, 3 for GO₂ and 3 for GH₂. Each of the GO₂ pressurization lines connects to the oxidizer heat exchanger outlet of 1 of the SSMEs at 1 end and the GO₂ ET pressurization manifold at the other end. Each of the GH₂ pressurization lines connects to the LPFT turbine outlet of 1 of the SSMEs at 1 end and the GH₂ ET pressurization manifold at the other end. Six flow control valves are used to control ullage pressure in the two ET propellant tanks.
 - 2. ET Pressurization Manifolds There are 2 2-inch diameter manifolds in the Orbiter, 1 for GO₂ and 1 for GH₂. At each end of both manifolds are self-sealing quick disconnects. The pressurization manifolds connect to the ET gaseous propellant umbilicals at 1 set of quick-disconnects and to the GSE helium pressurization umbilicals at the other set of quick-disconnects. The GSE helium pressurization umbilicals (2) are used for the initial pressurization of the ET propellant tanks during prelaunch.

Each pressurization manifold contains inlets for he 3 engine ET pressurization output lines. (The ET GH₂ pressurization manifold contains, in addition to the three inlets, an outlet for the GH₂ pressurization vent line. (See paragraph 3 below.)

- 3. GH2 Pressurization Vent Line This is a single line which connects to the ET GH2 pressurization manifold line at 1 end and to an overboard port at the other end. This line is used exclusively for vacuum inerting the GH2 pressurization lines during orbit. Flow through the line is controlled by the normally closed GH2 pressurization line vent valve which is mounted in the line. This valve is controlled by the GH2 PRESS LINE VENT switch on cockpit Panel R4.
- C. Valves There are 2 basic types of valves used in the PMS: those that are pneumatically actuated and those that are electrically actuated. Pneumatically actuated valves are used where large loads are encountered, such as in the control of liquid propellant flows. Electrically actuated valves are used where lighter loads are encountered, such as in the control of gaseous propellant flows.

Pneumatically actuated valves can be further divided into 2 subtypes - those that require pneumatic pressure to open and close the valve (type 1) and those that are spring-loaded to 1 position and require pneumatic pressure to move to the other position (type 2).

The following is a list of the type 1 valves.

LH₂ feedline disconnect valve

LO₂ feedline disconnect valve

LH₂ prevalves (3)

LO₂ prevalves (3)

LH₂ inboard fill/drain valve

LO2 inboard fill/drain valve

LH2 outboard fill/drain valve

LO2 outboard fill/drain valve

Each type 1 valve actuator is equipped with 2 electrically actuated solenoid valves. Each of the 2 solenoid valves controls helium pressure to either an "open" port or a "close" port on the actuator.

Energizing the solenoid valve connected to the "open" port will allow helium pressure to open the pneumatic valve. Similarly, closing of the pneumatic valve is performed by energizing the solenoid valve connected to the "close" port. (The LO₂ Prevalves have 4 solenoids, two redundant solenoids each to control helium pressure to the "open" and to the" closed" ports.)

Removing power from a solenoid valve not only removes helium pressure from the corresponding port of the pneumatic actuator, but also allows the helium pressure trapped in that side of the actuator to vent overboard. Removing power from both solenoids allows the pneumatic valve to remain in its last commanded position.

The following is a list of the type 2 valves.

LH2 RTLS inboard dump valve, Normally Closed (NC)

LH2 RTLS outboard dump valve (NC)

LH2 feedline relief shutoff valve, Normally Open (NO)

LO2 feedline relief shutoff valve (NO)

LO2 Pogo accumulator recirculation valve (NO)

Each type 2 valve is equipped with a single electrically actuated solenoid valve which controls helium pressure to either an "open" port or a "close" port on the Removing power from the solenoid valve actuator. removes helium pressure from the corresponding port of the pneumatic actuator and allows helium pressure trapped in that side of the actuator to vent overboard. Spring force will then take over and drive the valve to If the spring force drives the the opposite position. valve to the open position, the valve is referred to as a Normally Open (NO) valve. If the spring force drives the valve to the closed position, the valve is referred to as a Normally Closed (NC) valve.

The following is a list of the electrically actuated solenoid valves:

 ${\rm H}_2$ pressurization line vent valve (NC) GH₂ pressurization flow control valves (3) (NO) GO₂ pressurization flow control valves (3) (NO)

The above electrically actuated valves are spring-loaded to one position and move to the other position when power is applied. These valves are referred to as either normally open or normally closed, based on their position in the de-energized state.

Orbiter MPS - Helium Subsystem General Description 3.1.3

The helium subsystem consists of 7 4.7-ft3 helium supply tanks, 3 17.3-ft3 helium supply tanks, and their associated regulators, check valves, distribution lines, and control valves (Figure 5). Four of the 4.7-ft3 helium supply tanks are located within the Orbiter aft of the payload bay area. The other 3 4.7-ft3 supply tanks and the three 17.3-ft3 supply tanks are located below the payload bay liner and above the main landing gear cavity. Each of the 17.3-ft3 supply tanks is plumbed to two of the 4.7-ft3 supply tanks (1 in the mid-body, the other in the aft body) to form 3

sets of 3 tanks. Each set of tanks, thus formed, normally provides helium to only one engine and for this reason is commonly referred to by the engine's designation; for example, "left engine helium." This helium is used for in-flight purges of engines, aft compartments, and provides pressure for actuating engine valves during emergency pneumatic shutdowns.

The remaining 4.7-ft3 helium supply tank (the 1 which is not connected to a 17.3-ft3 tank) is called the "pneumatic helium" supply tank. It normally provides pressure to actuate all of the pneumatically operated valves within the propellant management subsystem (Figure 5).

Each of the 4 helium supply circuits described above (3 engine helium and one pneumatic helium) will operate independently until after MECO, when the 3 "out" helium interconnect valves will be opened, connecting all circuits to a common manifold. This interconnection can be performed manually by the crew; however, normally the GPC will automatically interconnect the circuits just before the start of the MPS propellant dump.

3.1.4 <u>Helium Subsystem Components</u>

The helium subsystem contains the following major components.

- A. Supply Tank Each engine helium supply tank cluster consists of 2 4.7-ft3 supply tanks and 1 17.3-ft3 supply tank. One of the 4.7-ft3 tanks and the 17.3-ft3 tank are located in the mid-body area of the Shuttle under the payload bay liner, in an area originally reserved for additional Power Reactant Supply and Distribution (PRSD) cryogenic storage. The 17.3-ft3 tank is identical to that used in the OMS. The remaining 4.7-ft3 tank is located in the rear of the Shuttle, aft of the payload bay bulkhead. The single 4.7-ft3 pneumatic helium supply tank is also located in this area. Prior to lift-off, all helium supply tanks will be pressurized to anominal value of 4500 psia.
- B. Solenoid Actuated Valves All of the valves in the helium subsystem are spring-loaded to one position and electrically actuated to the other position.

Valve position is controlled via electrical signals from either the GPCs or a manual switch. The crew can control only a portion of the valves through cockpit switches, the remainder are controlled automatically by the GPCs.

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► Individes crew has manual control capability I/C = interconnect

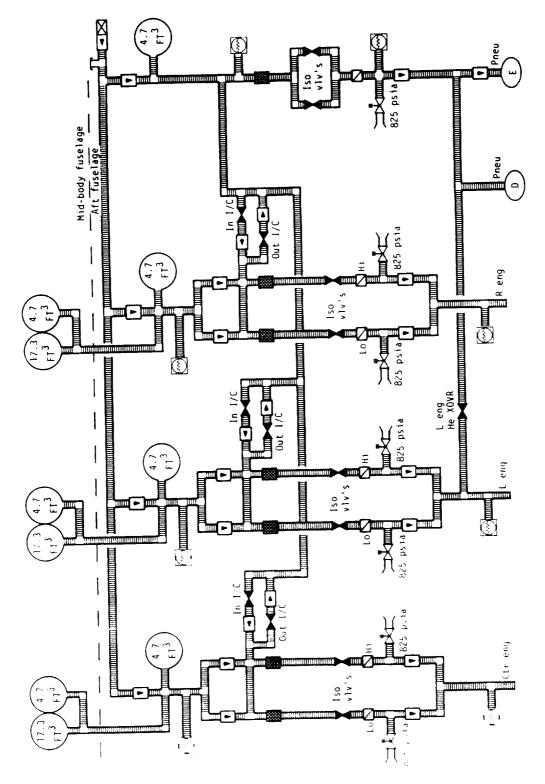


Figure 5 - HELIUM SUBSYSTEM; STORAGE AND REGULATION

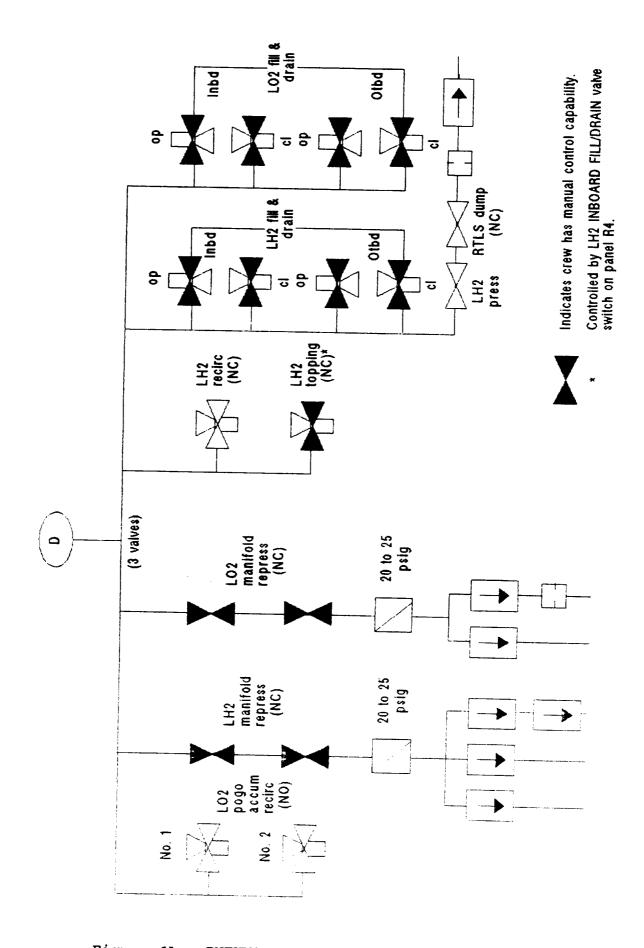


Figure 6A - PNEUMATIC HELIUM DISTRIBUTION

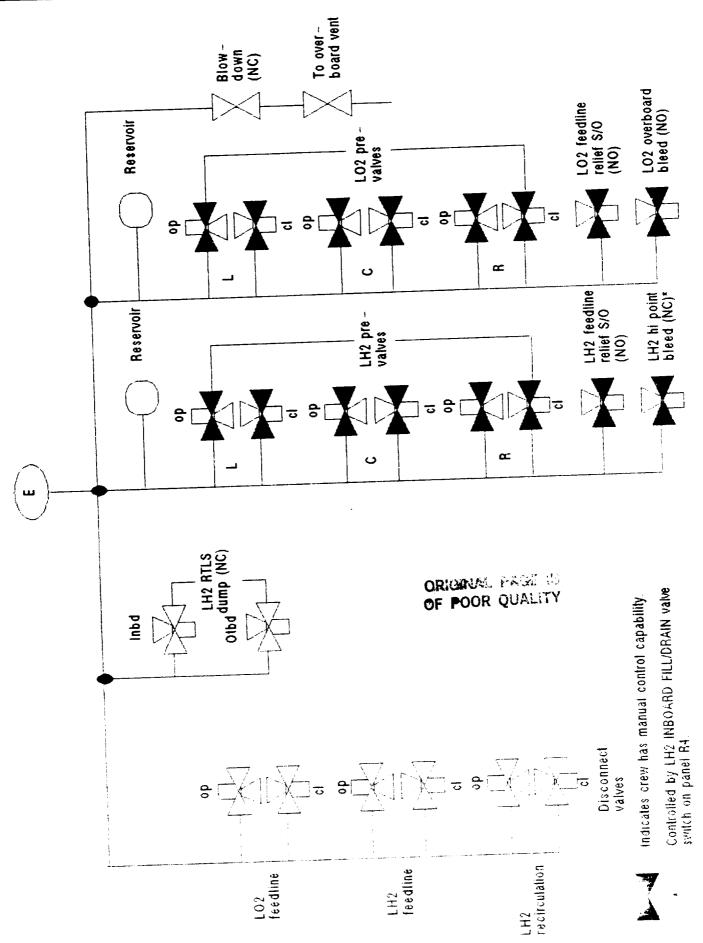


Figure 6B - PNEUMATIC HELIUM DISTRIBUTION (Concluded)

C. Supply Tank Isolation Valves - There are 8 supply tank isolation valves in the helium subsystem. The valves are connected in parallel to each engine helium supply tank cluster and to the pneumatic supply tank in pairs. In the case of the engine helium supply tanks, each pair of isolation valves control helium flow through 1 leg of a dual helium supply regulator circuit. Each helium supply circuit contains 2 check valves, a filter, an isolation valve, a regulator, and a relief valve.

The 2 isolation valves connected to the pneumatic supply tank are also connected in parallel. The rest of the corresponding helium supply circuit consists of a filter, the 2 isolation valves, a regulator, a relief valve, and a single check valve.

Each isolation valve (with the exception of the 2 pneumatic helium isolation valves) can be individually controlled by its own cockpit switch. The 2 pneumatic helium isolation valves are controlled by a single switch on Panel R2.

Interconnect Valves - Each engine helium supply tank D. cluster has 2 interconnect valves. Each valve in the pair of interconnect valves is connected in series with a check valve. Because of the check valves, helium can flow through the interconnect valves in 1 direction The interconnect valves are oriented in such a manner that 1 interconnect valve controls helium flow into the circuit and the other interconnect valve controls helium flow out of the circuit. The "in" interconnect valve controls the flow into the associated engine helium distribution lines from the pneumatic helium supply tank. The "out" interconnect valve controls helium flow out of the associated engine helium supply tank cluster to the pneumatic helium distribution lines.

Each pair of interconnect valves (per engine) is controlled by a single cockpit switch. This switch has 3 positions: IN OPEN/OUT CLOSE, GPC, and IN CLOSE/OUT OPEN. With the switch in the IN OPEN/OUT CLOSE position, the "in" interconnect valve will be opened and the "out" interconnect valve closed. The IN CLOSE/ OUT OPEN switch position will do the reverse. With the switch in the GPC position, both valves are closed unless commanded to the open position by the GPCs. In the event of an RTLS during a normal flight the GPC will signal the "in" interconnect valve to open automatically at MECO and close automatically 20 seconds later. The "out" interconnect valve is opened automatically at the beginning of the LO2 dump and closed automatically at

the end of the LH₂ dump. If an engine was shut down prior to MECO, however, the corresponding "in" interconnect valve will remain closed at MECO. At any other time, placing the switch in the GPC position results in both interconnect valves closing and remaining closed.

There is an additional crossover (interconnect) valve connected downstream of the left engine helium supply regulators to the pneumatic helium distribution system. In the event of a pneumatic helium regulator failure (Note: only 1 regulator in this line), this crossover valve would be opened, the pneumatic helium isolation valve would be closed, and the left engine helium supply would then provide regulated helium pressure through the crossover valve to the pneumatic helium distribution system. This crossover valve is controlled by its own 3-position cockpit switch. The 3 switch positions are labeled OPEN, GPC, and CLOSE.

- E. Manifold Pressurization Valves (Figure 6A) The manifold pressurization valves are located downstream of the pneumatic helium pressure regulator and are used to control the flow of helium to the propellant manifolds during nominal propellant dumps and manifold repressurization. There are 4 of these valves, grouped in pairs. One pair of valves controls helium pressure to the LO₂ propellant manifolds, and the other pair controls helium pressure to the LH₂ propellant manifolds.
- F. LH₂ RTLS Dump Pressurization Valves (Figure 6B) The LH₂ RTLS dump pressurization valves are located downstream of the pneumatic helium pressure regulator and are used to control the pressurization of the LH₂ propellant manifolds during an RTLS LH₂ dump. There are 2 of these valves, connected in series. Unlike the LH₂ manifold pressurization valves, the LH₂ RTLS dump pressurization valves cannot be controlled from the cockpit. During an RTLS abort, valves will be opened and closed automatically by GPC commands.

One additional difference between the nominal and the RTLS $\rm LH_2$ dumps is in the routing of the helium and the location at which it enters the $\rm LH_2$ feedline manifold. For the nominal $\rm LH_2$ dump, helium passes through the $\rm LH_2$ manifold pressurization valves and enters the feedline manifold in the vicinity of the $\rm LH_2$ feedline disconnect valve. For the RTLS $\rm LH_2$ dump, helium passes through the $\rm LH_2$ RTLS dump pressurization valves and enters the feedline manifold in the vicinity of the $\rm LH_2$ inboard fill/drain valve (on the inboard side).

- G. Pressure Regulators Each engine helium supply tank cluster has 2 pressure regulators, operating in parallel. Each regulator controls pressure in 1 leg of a dual-redundant helium supply circuit. The pressure regulators for the helium supply tanks are set to provide outlet pressures in the range of 715 psig to 770 psig. Downtream of this regulator are 2 more regulators, the LH₂ manifold pressure regulator and the LO₂ manifold pressure regulator. These regulators are used only during MPS propellant dump and manifold repressurization. Both regulators are set to provide outlet pressures in the range of 20 to 25 psig. Flow through the regulators is controlled by the appropriate set (2) of normally closed manifold pressurization valves (Figure 6).
- H. Relief Valves Downstream of each pressure regulator (with the exception of the 2 manifold repress regulators) is a relief valve. The purpose of the relief valve is to protect the downstream helium distribution lines from the overpressurization (and rupture) in the event the associated pressure regulator fails fully open. The relief valves in the helium supply circuits are set to relieve at 825 +/- 25 psig and reseat at 785 psig.

3.2 Interfaces and Locations

The MPS system hardware is located in the aft fuselage compartment behind the payload bay but forward of the main engines. The MPS system interfaces with the Orbiter's 3 main engines, the external tank, and the ground during prelaunch and post landing.

3.3 Hierarchy

Figure 2 illustrates the hierarchy of the MPS hardware components.

4.0 ASSESSMENT RESULTS

The IOA analysis of the MPS hardware initially generated 690 failure mode worksheets and identified 371 Potential Critical Items (PCIs) before starting the assessment process. In order to facilitate comparison, 573 additional failure mode analysis worksheets were generated. These analysis results were compared to the proposed NASA Post 51-L baseline of 1264 FMEAs and 749 CIL items. Upon completion of the assessment, 865 of the 1264 FMEAs were in agreement. Schedule and budget constraints prevented resolution of those that were not in agreement.

A summary of the quantity of NASA FMEAs assessed, versus the recommended IOA baseline, and any issues identified is presented in Table I.

Table I S	ummary of I	DA FMEA Ass	sessment
Component	NASA	IOA	Issues
Mechanical Electrical	606 658	623 742	179 220
TOTAL	1264	1365	399

A summary of the quantity of NASA CIL items assessed, versus the recommended IOA baseline, and any issues identified is presented in Table II. The issues count shown accounts for those cases where a RI/NASA analysis was matched to more than one IOA analysis and thus may have been declared an issue on more than one assessment sheet. When the multiple IOA recommended criticalities generated in this way agree, only one issue is included in the count.

Table II:	: Summary of IOA CIL Assessment				
Component	NASA	IOA	Issues		
Mechanical Electrical	475 274	410 301	86 105		
TOTAL	749	711	191		

Appendix C presents the detailed assessment worksheets for each failure mode identified and assessed. Appendix D highlights the NASA Critical Items and corresponding IOA worksheet ID. Appendix E contains IOA analysis worksheets supplementing previous analysis results reported in Space Transportation System Engineering and Operations Support (STSEOS) Working Paper No.1.0-WP-VA86001-22, Analysis of the Main Propulsion System, 16 January 1987. Appendix F provides a cross reference between the NASA FMEA and corresponding IOA worksheet(s). IOA recommendations are also summarized.

Table III presents a summary of the IOA recommended failure criticalities for the Post 51-L FMEA baseline.

TABLE III: Su	mmary o	of IOA	Recomm	ended F	ailure	Critic	alities
Criticality:	1/1	2/1R	2/2	3/1R	3/2R	3/3	TOTAL
Mechanical Electrical	229 10	124 106	2	57 360	0	211 263	623 742
TOTAL	239	230	2	417	3	474	1365

Of the failure modes analyzed, 714 were determined to be critical items. A summary of the IOA recommended critical items is presented in Table IV.

TABLE IV:	Summaı	ry of I	OA Reco	mmende	l Critic	al Ite	ems
Criticality:	1/1	2/1R	2/2	3/1R	3/2R	3/3	TOTAL
Mechanical	229	124	2	35	0	20	410 301
Electrical	10	106	0	183	0		301
TOTAL	239	230	2	218	0	22	711

The scheme for assigning IOA assessment (Appendix C) and analysis (Appendix E) worksheet numbers is shown in Table V.

Table V IOA Worksheet Numbers				
Components	IOA ID Number			
LO ₂ Mechanical LH ₂ Mechanical Helium Mechanical LO ₂ Electrical LH ₂ Electrical Helium Electrical Supplemental Electrical Supplemental Mechanical	1001 - 1292 2001 - 2393 3010 - 4666 5000 - 5779 6011 - 6160 7100 - 7610 1 - 200, 401 - 838 201 - 400, 901 - 924			

4.1 Assessment Results - Mechanical Components

The IOA Assessment of the RI/NASA MPS mechanical component FMEA/CIL review resulted in 412 issues, or differences, in analysis results.

Differences between IOA and RI/NASA are attributable to several factors. The Instructions for Preparation of FMEA/CIL (NSTS 22206) document is in many places subject to varying interpretation. IOA and RI/NASA differed on several points.

The RI/NASA team tended to have a broader view of an item's function than did IOA. This led, in many cases, to different criticalities.

Another difficulty was the matter of redundancy. (This is related to the issue of function, noted above.) Again, the RI/NASA team adopted a broader view of redundancy than did IOA. The RI/NASA team, for example, viewed sequential main engine failures as loss of redundancy. IOA believes engines are not redundant to each other because, while they perform identical functions, they do not perform the same function. That is, when one engine is shut down, the remaining engines cannot provide the thrust that has been lost. (An exception would be periods of reduced throttle level, but these are excluded by the FMEA/CIL "worst case" requirement.)

The NSTS 22206 document, however, requires (2.3.3L) that a functional criticality of 1R be assigned to any failure(s) that result in an engine shutdown. A single engine shutdown will result in an intact abort, thus the logical functional criticality assignment would be 2R, for loss of mission. The RI/NASA analysis arrived at a 1R functional criticality not because of the requirement, but because of an interpretation of redundancy that differs from that of the IOA.

Yet another area of differing opinions was the RI/NASA practice of introducing criticality 1/1 failures, such as line breaks or leaks, as a second failure, thereby creating a 2/1R criticality regardless of the first failure. IOA concludes that, in most cases, this is not consistent with the NSTS 22206 methodology or definitions.

The foregoing differences of opinion and interpretation are the primary causes of the different results of the IOA and RI/NASA FMEA/CIL. Figure 1 presents a comparison of the proposed Post 51-L NASA baseline, with the IOA recommended baseline, and any issues.

4.2 Assessment Results - Electrical/Electronic Components

Analyses of electrical/electronic components are a reflection of their corresponding mechanical components. As such, the same differences of opinion and interpretation resulted in similar differences in criticality assignment as for the mechanical components. These are explained in Section 4.1 above.

5.0 REFERENCES

Reference documentation available from NASA and Rockwell was used in the analysis. The documentation used included the following:

- 1. Main Propulsion System Workbook, 3/01/82
- Main Propulsion System Fluid Flows, 10/25/78
- 3. Shuttle Flight Operations Manual, Volume 8A, MPS, 8/31/81
- 4. Booster Systems Briefs, 10/01/84
- 5. SSME Training Data, Engine Orientation, 5/31/80
- 6. Instructions for Preparation of FMEA and CIL for the STS, NSTS 22206, 10/10/86
- Space Shuttle Systems Handbook, Volumes 1-2, Revision C, DNC-5, 9/13/85
- 8. Integrated System Schematic, MPS, OV-099, 103, 104, 5/27/86
- 9. STS Mission Problem Tracking List
- 10. OV-099 Operational Configuration CIL, Mechanical/Fluid Systems, Book 1 of 4, 3/01/82
- 11. OV-099 Operational Configuration CIL, ECLSS/Power Systems, Book 2 of 4, 3/01/82
- 12. OV Operational Configuration CIL, Propulsion Systems, Book 3 of 4, 11/01/82
- 13. OV Operational Configuration CIL, Avionics Systems, Book 4 of 4, 11/01/82
- 14. Operations and Maintenance Requirements and Specifications, 12/17/85
- 15. Operations and Maintenance Requirements and Specification Document, 3/06/86
- 16. Problem Records, 7/22/86
- 17. Shuttle Orbiter OV-102 CDR, Safety Analysis Report, Volume 1, Management Summary, 4/27/77
- 18. Shuttle Orbiter OV-102 CDR, Safety Analysis Report, Volume II, Structures Systems, 4/27/77
- 19. Shuttle Orbiter OV-102 CDR, Safety Analysis Report, Volume III, Mechanical Systems, 4/27/77
- 20. Shuttle Orbiter OV-102 CDR, Safety Analysis Report, Volume IV, Propulsion Systems, 4/27/77
- 21. Shuttle Orbiter OV-102 CDR, Safety Analysis Report, Volume V, Power System, 4/27/77
- 22. Shuttle Orbiter OV-102 CDR, Safety Analysis Report, Volume VII, ECLSS, 4/27/77
- 23. Shuttle Orbiter OV-102 CDR, Safety Analysis Report, Volume VIII, Crew Station Systems, 4/27/77
- 24. FMEA Lightweight and Heavyweight Tanks, 7/20/81
- 25. Integrated System Schematic, OV-102, MPS, 10/26/79
- 26. Crew Software Interface, CSI 2102, 9/30/84

27. Rockwell International Component Specifications:

- a. MC271-0073, LH_2 Engine Feed Line Assembly, 10/26/83
- b. MC271-0074, LO_2 Engine Feed Line Assembly, 11/07/83
- c. MC271-0075, LH_2^2 Line Assembly, 5/28/80
- d. MC271-0076, LH_2^2/LO_2 Fill & Drain Line Assembly, 12/02/83
- e. MC276-0003, 1 Inch GHE & GN2 Disconnect, 1/11/85
- f. MC276-0004, 1.5 Inch LO₂/LH₂ Disconnect, 1/04/85
- g. MC276-0005, LO₂/LH₂ Orbiter to Ground Fill & Drain Disconnect, 4/18/83
- h. MC276-0032, Test Point Couplings, 2/10/75
- i. MC280-0017, H2 & O2 Pressurant Flow Control Valve 4/11/84
- j. MC281-0030, LH₂ Recirculation Pump Assembly, 4/12/82
- k. MC284-0389, LH₂/LO₂ Orbiter to Tank Feed System Disconnect, 2/01/82
- 1. MC284-0390, LH₂ Orbiter to Tank Recirculation Disconnect, 7/27/79
- m. MC284-0391, GH2/GO2 Orbiter to Tank Disconnect, 10/25/79
- n. MC284-0395, LO_2/LH_2 1.5/2 Inch Shutoff Valve, 6/27/79
- o. MC284-0396, Propellant Shutoff Prevalve, 7/24/82
- p. MC284-0397, Propellant Fill & Drain Valve, 6/22/84
- q. MC284-0403, Two Way Solenoid Valve, 6/24/80
- r. MC284-0406, LO_2/LH_2 Relief Shutoff Valve, 5/05/76
- s. ME284-0479, Engine Isolation Check Valve, 8/20/80
- t. MC284-0501, Engine Isolation Check Valve, 1/31/83
- u. MC284-0515, Dual Check Valve, 11/11/82
- v. MC432-0205, LO_2/LH_2 Level Point Sensor, 4/15/81
- w. ME284-0472, HE Check Valve, 4/04/80
- x. MC284-0404, 3 Way HE Solenoid Valve, 4/01/75
- y. MC284-0533, HE Regulator, 11/13/79
- z. MC284-0399, LO₂ Manif Repress Regulator
- aa. MC284-0398, HE Relief Valve, 12/14/77
- bb. MC282-0082, HE Supply Tank, 12/14/76
- CC. MC282-0070, LO2 Prevalve Pneu Accumulator, 10/31/75
- dd. ME276-0032, Test Point Coupling, 2/10/75
- ee. ME284-0474, LH₂ 3/8 Inch Relief Valve, 9/10/74
- ff. ME286-0056, HE Supply Filter, 11/04/74
- gg. V070-451756, Pneu HE Panel 4 Test Port
- hh. VO70-415532, LH₂ Repress Reg Outlet Test Port, 12/08/75
- ii. VO70-415568, LO2 Repress Reg Outlet Test Port, 5/17/76
- jj. V070-415585, Helium Fill Disc. Check Valve Test Port, 4/16/76
- kk. VO70-415446, LO2 Prepress Disc. Check Valve Test Port, 3/11/76

- ll. V070-415790, HE Supply Test Port, 4/13/78
- mm. VO70-415133, Check Valve CV24 Leakage Test Port, 8/21/80
- nn. V070-415545, LH_2 Feed Manif RTLS Repress Orifice, 12/19/75
- OO. VO70-414548, LH₂ Pressurization System Test Port Fittings, 3/25/76
- qq. VO70-415552, GO2 Pressurization Manifold Orifice Assembly, 3/05/76

APPENDIX A ACRONYMS

		n 1 ' 73 3 Wales
AFV	-	Anti-Flood Valve
ASI	_	Augmented Spark Igniter
ATVC	-	Ascent Thrust Vector Control
CCV	_	Chamber Coolant Valve
CCVA	-	Chamber Coolant Valve Assembly
EIU	-	Engine Interface Unit
EMR	-	Engine Mixture Ratio
ET	-	External Tank
FBV	-	Fuel Bleed Valve
FPB	-	Fuel Preburner
\mathtt{FPL}	-	Full Power Level
FPOV	-	Fuel Preburner Oxidizer Valve
GCV	-	Gaseous Oxygen Control Valve
GH2	-	Gaseous Hydrogen
GHe	-	Gaseous Helium
GN2	_	Gaseous Nitrogen
GND	_	Ground
GO2	_	Gaseous Oxygen
GSE	_	Ground Support Equipment
H2	-	Hydrogen
He	-	Helium
HEX	-	Heat Exchanger
HGM	_	Hot Gas Manifold
HPFT	_	High Pressure Fuel Turbopump
HPOT	_	High Pressure Oxidizer Turbopump
HPV	-	Helium Precharge Valve
I/C	_	Interconnect
ISP	_	Specific Impulse
LH2	_	Liquid Hydrogen
LO2	_	Liquid Oxygen
LOX	_	Liquid Oxygen
LPFT	_	Low Pressure Fuel Turbopump
LPOT	_	Low Pressure Oxidizer Turbopump
LPS	_	Launch Processor System
		Launch Processing System
MANF		Manifold
MCC	_	Main Combustion Chamber
ME	-	Main Engine
MEC		Master Events Controller
MECO		Main Engine Cutoff
MFV	_	Main Fuel Valve
MOV	_	Main Oxidizer Valve
MPL	_	Minimum Power Level
MPS	_	Main Propulsion System
MVA	_	Main Valve Actuator
MVA NC	_	Normally Closed
NC NO	_	Normally Open
NO NPSP	_	Net Positive Suction Pressure
NESE	-	MEC LOSICIAC DECCTON LICEDATE

ACRONYMS

OBV Oxidizer Bleed Valve OPB Oxidizer Preburner OPOV Oxidizer Preburner Oxidizer Valve PAV Pressure Actuated Valve P/B Preburner PBVA Propellant Bleed Valve Assembly PC Chamber Pressure PCI Potential Critical Item PCI - Potential Critical Item
PCV - Purge Check Valves
PMS - Propellant Management Subsystem
POP - Preburner Oxidizer Pump
RIV - Recirculation Isolation Valve
RPC - Remote Power Controller
RPL - Rated Power Level
SRB - Solid Rocket Booster
SSME - Space Shuttle Main Engine
SSMEC - SSME Controller

APPENDIX B

DEFINITIONS, GROUND RULES, AND ASSUMPTIONS

- B.1 Definitions
- B.2 Project Level Ground Rules and Assumptions
- B.3 Subsystem-Specific Ground Rules and Assumptions

APPENDIX B DEFINITIONS, GROUND RULES, AND ASSUMPTIONS

B.1 Definitions

Definitions contained in NSTS 22206, Instructions For Preparation of FMEA/CIL, 10 October 1986, were used with the following amplifications and additions.

INTACT ABORT DEFINITIONS:

RTLS - begins at transition to OPS 6 and ends at transition
to OPS 9, post-flight

<u>TAL</u> - begins at declaration of the abort and ends at transition to OPS 9, post-flight

AOA - begins at declaration of the abort and ends at transition to OPS 9, post-flight

ATO - begins at declaration of the abort and ends at transition to OPS 9, post-flight

<u>CREDIBLE (CAUSE)</u> - an event that can be predicted or expected in anticipated operational environmental conditions. Excludes an event where multiple failures must first occur to result in environmental extremes

<u>CONTINGENCY CREW PROCEDURES</u> - procedures that are utilized beyond the standard malfunction procedures, pocket checklists, and cue cards

EARLY MISSION TERMINATION - termination of onorbit phase prior to planned end of mission

EFFECTS/RATIONALE - description of the case which generated the
highest criticality

HIGHEST CRITICALITY - the highest functional criticality
determined in the phase-by-phase analysis

 ${\hbox{{\tt MAJOR MODE (MM)}}\over\hbox{(OPS)}}$ - major sub-mode of software operational sequence

 $\underline{\text{MC}}$ - Memory Configuration of Primary Avionics Software System (PASS)

 ${
m MISSION}$ - assigned performance of a specific Orbiter flight with payload/objective accomplishments including orbit phasing and altitude (excludes secondary payloads such as GAS cans, middeck P/L, etc.)

MULTIPLE ORDER FAILURE - describes the failure due to a single cause or event of all units which perform a necessary (critical) function

OFF-NOMINAL CREW PROCEDURES - procedures that are utilized beyond the standard malfunction procedures, pocket checklists, and cue cards

OPS - software operational sequence

PRIMARY MISSION OBJECTIVES - worst case primary mission objectives are equal to mission objectives

PHASE DEFINITIONS:

PRELAUNCH PHASE - begins at launch count-down Orbiter power-up and ends at moding to OPS Major Mode 102 (liftoff)

<u>LIFTOFF MISSION PHASE</u> - begins at SRB ignition (MM 102) and ends at transition out of OPS 1 (Synonymous with ASCENT)

ONORBIT PHASE - begins at transition to OPS 2 or OPS 8 and ends at transition out of OPS 2 or OPS 8

<u>DEORBIT PHASE</u> - begins at transition to OPS Major Mode 301 and ends at first main landing gear touchdown

<u>LANDING/SAFING PHASE</u> - begins at first main gear touchdown and ends with the completion of post-landing safing operations

APPENDIX B DEFINITIONS, GROUND RULES, AND ASSUMPTIONS

B.2 IOA Project Level Ground Rules and Assumptions

The philosophy embodied in NSTS 22206, Instructions for Preparation of FMEA/CIL, 10 October 1986, was employed with the following amplifications and additions.

1. The operational flight software is an accurate implementation of the Flight System Software Requirements (FSSRs).

RATIONALE: Software verification is out-of-scope of this task.

2. After liftoff, any parameter which is monitored by system management (SM) or which drives any part of the Caution and Warning System (C&W) will support passage of Redundancy Screen B for its corresponding hardware item.

RATIONALE: Analysis of on-board parameter availability and/or the actual monitoring by the crew is beyond the scope of this task.

 Any data employed with flight software is assumed to be functional for the specific vehicle and specific mission being flown.

RATIONALE: Mission data verification is out-of-scope of this task.

4. All hardware (including firmware) is manufactured and assembled to the design specifications/drawings.

RATIONALE: Acceptance and verification testing is designed to detect and identify problems before the item is approved for use.

5. All Flight Data File crew procedures will be assumed performed as written, and will not include human error in their performance.

RATIONALE: Failures caused by human operational error are out-of-scope of this task.

6. All hardware analyses will, as a minimum, be performed at the level of analysis existent within NASA/Prime Contractor Orbiter FMEA/CILs, and will be permitted to go to greater hardware detail levels but not lesser.

RATIONALE: Comparison of IOA analysis results with other analyses requires that both analyses be performed to a comparable level of detail.

7. Verification that a telemetry parameter is actually monitored during AOS by ground-based personnel is not required.

RATIONALE: Analysis of mission-dependent telemetry availability and/or the actual monitoring of applicable data by ground-based personnel is beyond the scope of this task.

8. The determination of criticalities per phase is based on the worst case effect of a failure for the phase being analyzed. The failure can occur in the phase being analyzed or in any previous phase, whichever produces the worst case effects for the phase of interest.

RATIONALE: Assigning phase criticalities ensures a thorough and complete analysis.

9. Analysis of wire harnesses, cables, and electrical connectors to determine if FMEAs are warranted will not be performed nor FMEAs assessed.

RATIONALE: Analysis was substantially complete prior to NSTS 22206 ground rule redirection.

10. Analysis of welds or brazed joints that cannot be inspected will not be performed nor FMEAs assessed.

RATIONALE: Analysis was substantially complete prior to NSTS 22206 ground rule redirection.

11. Emergency system or hardware will include burst discs and will exclude the EMU Secondary Oxygen Pack (SOP), pressure relief valves and the landing gear pyrotechnics.

RATIONALE: Clarify definition of emergency systems to ensure consistency throughout IOA project.

APPENDIX B

B.3 SUBSYSTEM SPECIFIC GROUNDRULES AND ASSUMPTIONS

The IOA was performed to the component/assembly level of the subsystem of the MPS. The analysis considered the worst case effects of the hardware/functional failure on the subsystem, mission, and crew/vehicle safety.

1. All like and unlike redundancy will be considered in determining functional criticality. The MPS function is to provide delta V for the vehicle to reach orbit. Since loss of 1 main engine during the early part of ascent requires a mission abort, any failure that results in the loss of 1 main engine will be considered loss of mission (Crit 2). Since, for most of the ascent, 2 engines are required for a successful abort, loss of 2 or 3 engines will be considered loss of life/vehicle (Crit 1).

RATIONALE: These failure modes are directly applicable to worst case MPS subsystem component analyses.

2. Only MPS Orbiter items will be analyzed for the MPS interface to the Ground, External Tank, and the Main Engines.

RATIONALE: Non-orbiter program hardware are not within the scope of this task.

3. Aborts are assumed to be caused by loss of an engine. Any failure within a component that can shut down an engine could leave only 1 engine in operation and therefore could lead to loss of vehicle (Crit 1).

RATIONALE: This failure mode is directly applicable to worst case MPS subsystem component analysis.

APPENDIX C DETAILED ASSESSMENT

This section contains the IOA assessment worksheets generated during the assessment of this subsystem. The information on these worksheets resulted from the comparison of the RI/NASA FMEA/CIL (Post 51-L) to the IOA analysis worksheets in MDAC Working Paper 1.0-WP-VA86001-22 with additional worksheets in Appendix E. Each of these worksheets identifies the NASA FMEA being assessed, corresponding MDAC Analysis Worksheet ID (Appendix E), hardware item, criticality, redundancy screens, and recommendations. For each failure mode, the highest assessed hardware and functional criticality is compared and discrepancies noted as "N" in the compare row under the column where the discrepancy occurred.

LEGEND FOR IOA ASSESSMENT WORKSHEETS

Hardware Criticalities:

= Loss of life or vehicle

= Loss of mission or next failure of any redundant item (like or unlike) could cause loss of life/vehicle

= All others

Functional Criticalities:

1R = Redundant hardware items (like or unlike) all of which,

if failed, could cause loss of life or vehicle

2R = Redundant hardware items (like or unlike) all of which, if failed, could cause loss of mission

Redundancy Screens A, B and C:

= Passed Screen

F = Failed Screen

NA = Not Applicable

NASA Data:

Baseline = NASA FMEA/CIL

= Baseline with Proposed Post 51-L Changes New

CIL Item :

X = Included in CIL

Compare Row:

= Non compare for that column (deviation)

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* CIL RE	TEI	NT:	ION 1	RAT	'ION <i>I</i>	LI	Ξ:	(I	fa	pp	1 i	Lca		7			JATE JATE		[]	
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SUBSYSTEM: MDAC ID: ITEM:		EPD&C/ 6 DIODE			ı					
LEAD ANALYST	r:	B. SL	AUGH	TER						
ASSESSMENT:										
	rical: Fligh		F	EDUNI	DANCY	SCRE	ENS		CIL	
	OW/FU		A		В		С			
NASA [2	2 /1R 2 /1R]	[E))	[P]	[P]	(X)	*
COMPARE [/]	[]	[]	[]	[]
RECOMMENDAT	ions:	(If	dii	fere	nt fr	om NA	SA)			
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* CIL RETENT	rion	RATION	ALE:	(If	appl	icabl	A	DEQUATE]]
REMARKS: ONLY AVAIL	REF:	MPS/E	PDC	FMEA	REVI	EW SU	MMAR	RY 8-17-8	37.	

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SUBSYST				7	PD&C/ YBRID			IVER	C	ONT	ΓF	ROLI	LER	s,	, •	ry p i	E I	(:	2)			
LEAD AND	ALY	ST	:	В	. SLA	UGI	H.	rer .														
ASSESSMI	ENT	:																				
		F	LIG		Ž.	1		EDUN	DA	NC)		SCI	REE	NS	c				CI	L EM	[
NASA						_	_					_		_	_							
IOA	[3	/1	R]		[]	5]		[F	•]		[[P P]			[]	*
COMPARE	[/]		[]]]		[]			[]	
RECOMMEN	IDA:	ric	ONS	:	(If	dif	ff	erer	nt	fr	0	m N	IASA	A)								
	[/]		[]		C]	1]	(AD	[D/	DE] LE	TE)
* CIL RE	TE	NT]	ION	RAT	'IONA	LE:		(If	aj	ppl	i	cab					ATE		[]	
REMARKS: ONLY AVA		RE	EF:	MP	S/EPI	oc	F	MEA	RI	EVI	E	W S					ATE		•]	

ASSESSMEN ASSESSMEN NASA FMEA	T I		MPS	8/88 -008 4-2		SA DATA ASELINE NEW									
SUBSYSTEM MDAC ID: ITEM:	1:		8	&C/I BRID		IVER	con	rol	LERS,	T'	YPE III	(4))		
LEAD ANAI	LYST	:	В.	SLA	JGH	TER									
ASSESSMEN	IT:														
CRITICALITY REDUNDANCY SCREENS FLIGHT															
		W/FU			A		1	В		С					
NASA IOA	[3	/1R /1R]		[P]	[]	F] F]	[P P]	[]	K] K]	*	•
COMPARE	[/]		()	[]	[]	[]	
RECOMMENI	DATI	ons:		(If	dif	fere	ent f	rom	NASA)					
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* CIL RE	rent	NOI	RAT:	IONA	LE:	(I:	f app	lica			EQUATE EQUATE]	
REMARKS: ONLY AVA	IL F	REF:	MP	S/EP	DC	FME	A REV	IEW	SUMM	ARY	8-17-8	37.			

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SUBSYSTE MDAC ID:					9	PD&C	-		2 A	(2))											
LEAD ANA	LY	ST	:		в.	SL	AU	GH'	ref	2												
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		F	LI	GH'		?		RI A	EDU	J N D#		Y B	SCI	REEI	is C				CI)			
NASA							r		,			_	,		Ī							
NASA IOA	[3	1	1R]		[P]		[F F])]	P]		() [3	K K]]	*
COMPARE	[/]		[N]		(]	[]		[])	
RECOMMEN	DAT	ric	ON:	s:		(If	d:	ifí	fer	ent	: f	rc	m N	NASA	.)							
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* CIL RE	TEN	T)	[0]	N F	TAS	ION?	ΑLI	E :	(I	f a	qq.	li	.cak		A		UATE UATE]]		
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ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	2/09/88 MPS-010 2381-3	S OX]		SA DATA: ASELINE NEW	[]	
SUBSYSTEM: MDAC ID: ITEM:	EPD&C/M 10 DIODE	(PS										
LEAD ANALYST:	B. SLAU	JGHT	ER									
ASSESSMENT:												
CRITICAL		RE	DUNDA	NCY	SCREE	NS				L CEM	ſ	
FLIGH HDW/FU		A		В			С				-	
NASA [3 /1R IOA [3 /1R]	[P]	[F]	[P P]]	[X]	*
COMPARE [/]	[]	[N]	[]	[N]	
RECOMMENDATIONS:	(If	diff	erent	fr	om NAS	SA)						
[3 /1F	2]	[P]	[P]	[P] (A		D / DI		ETE)
* CIL RETENTION	RATIONA	LE:	(If a	appl	icable			EQUATE EQUATE	[]	
REMARKS: THE FAILURE IS F	READILY	DETI	ECTABI	LE.								

ASSESSME ASSESSME NASA FME	ENT	I	D:	M	/09/ PS-0 038-	11										DATA ELINI NEV	E []	
SUBSYSTE MDAC ID:				1:	PD&C l DGGL				I											
LEAD ANA	LY	ST	:	В	. SL	AU(GH'	TER												
ASSESSME	:NT	:																		
	CR		ICAL		č		R	EDUN	DA.	NCY	S	CRE	EN	s			С	IL	,	
]		LIGH' W/FU				A			E	3			С			Ι	TE	M	
NASA IOA		2	/1R /1R]]	P P]		[F	,]		[P P]		[X X]	*
COMPARE	[/]		[]	i	[]		[]		[]	
RECOMMEN	DA'	ric	ONS:		(If	đi	Ĺ£1	fere	nt	fr	om	NAS	SA))						
	[/]		[)	1	[]		[]	(A		/ D 1		ETE)
* CIL RE	TEI	T	ION F	TAS	'ION <i>A</i>	ALE	E:	(If	aŗ	pl	ica	able	-			JATE JATE	[x]	

	1/22/88 MPS-012X 2263-1		NASA DATA: BASELINE NEW	
MDAC ID:	EPD&C/MPS 12 HIGH POINT C	PEN HDC (2)		
LEAD ANALYST:	B. SLAUGHTER			
ASSESSMENT:				
CRITICAL: FLIGHT HDW/FUI	r	NDANCY SCREEN B	is C	CIL ITEM
·		r D 1	ו סו	г ү 1 *
NASA [2 /1R IOA [2 /1R] [P]	[P] [P]	[P]	[X] * [X]
COMPARE [/] []	[]	[]	[]
RECOMMENDATIONS:	(If differ	ent from NAS	A)	
[/] []	[]	[] (A)	[] DD/DELETE;
* CIL RETENTION	RATIONALE: () ADEQUATE INADEQUATE	[]

REMARKS:

ASSESSMI ASSESSMI NASA FMI	ENT ID:	,	013X		NASA DA BASELI N	
SUBSYSTI MDAC ID: ITEM:		13	C/MPS	R CONTROLI	ÆR	
LEAD AND	ALYST:	B. S	LAUGHTER			
ASSESSMI	ENT:					
	CRITICA FLIC HDW/I		REDUN A	IDANCY SCR	EENS C	CIL ITEM
NASA IOA	[2 /1	R] R]	[P] [P]	[F] [P]	[P] [P]	[X] * [X]
COMPARE	[/]	[]	[и]	[]	[]
RECOMMEN	IDATIONS	: (I	f differe	nt from N	ASA)	
	[2 /1	R]	[P]	[P]	[P]	[] (ADD/DELETE)
* CIL RE	TENTION	RATIO	NALE: (If	applicab	ADEQUATE	
DEMADES.					INADEQUATE	, []

FAILRUE IS DETECTABLE.

ASSESSMENT NASA FME	NΤ	ID	TE:	MP	25/8 S-01 67-1	L4 3	ζ							SA DAT. BASELIN NE	E]	
SUBSYSTE MDAC ID:	M:			14	D&C,			RAIN	OI	PEN	r SWI	TCH	E	BLOCKIN	G	DI	OD	Œ	
LEAD ANA	LYS	T:		в.	SL	AUC	GH'I	TER											
ASSESSME	NT:	;																	
		FI	CALI LIGHT V/FUI	ľ			RI A	EDUND	ANG	CY B	SCRE	ENS	c			CI	L	ī	
NASA IOA	[2 2	/1R /1R]		[P P]	[P P]	[P P]]	X X]	*
COMPARE	[/]		[]	[]	[]		[]	
RECOMMEN	DA!	ric	ons:		(If	đ	if:	feren	it :	fro	om NA	SA))						
	[/]		[]	[]	[] ((AI	[/Q(/DI	[] ELJ	ETE)
* CIL RE	TE	NT:	ION :	RAT	ION	AL	E:	(If	ap	pl:	icab]			DEQUATE DEQUATE		[]	

REMARKS:

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	1/25/88 MPS-015X 2267-2		NASA I BASEI	
SUBSYSTEM: MDAC ID: ITEM:	EPD&C/MPS 15 FILL AND		n switch block	KING DIODE
LEAD ANALYST:	B. SLAUGH	TER		
ASSESSMENT:				
CRITICAL FLIGH	r	EDUNDANCY	SCREENS	CIL ITEM
HDW/FUI	NC A	В	С	
NASA [2 /1R IOA [2 /1R] [P] [P] [F] [F] [P]] [P]	[X] * [X]
COMPARE [/] [] [] []	[]
RECOMMENDATIONS:	(If dif:	ferent fro	om NASA)	
[/] [] [] []	[] (ADD/DELETE
* CIL RETENTION H	RATIONALE:	(If appli	cable) ADEQUA INADEQUA	
REMARKS:				

ASSESSMENT ASSESSMENT NASA FMEA	ID:	1/25/8 MPS-01 2272-1	L6X						•		SA DA' ASELII Ni	NE	[x]				
SUBSYSTEM: MDAC ID: ITEM:	:	EPD&C/ 16 HIGH I			OPEN	SW	ΙΤ	сн в	LO	CK	ING D	IOD	ES (2)			
LEAD ANAL	YST:	B. SL	AUG	HTE	ER												
ASSESSMEN!	r:																
C	RITICAL FLIGH			REI	DUNDAI	NCY	S	CREE	NS				CIL ITEM	[
	HDW/FU			A		F	3			С							
NASA IOA	[3 /3 [3 /1R]	[NA P]]	1] I]	IA]] [NA P]		[]	*		
COMPARE	[/N]	[N]	[]	1]		[N]		[]			
RECOMMEND	ATIONS:	(If	di	.ff	erent	f	con	n NAS	A)								
	[3 /1R]	[P]	[]	P]		[P]	(AI	[DD/DI] ELE	TE)		
* CIL RET	ENTION	RATION	ALE	Ε:	(If a	pp:	lic	cable			DEQUAT DEQUAT]			
REMARKS: ONLY REF	AVAIL:	MPS/E	PDC	F	MEA R	EV	IEV	v sun	MZ	AR'	¥ 8−17	7-8	7.				

ASSESSME	ASSESSMENT DATE: 1/25/88 ASSESSMENT ID: MPS-017X NASA FMEA #: 2272-2											NASA BASE	LINE	[: [] [x]				
SUBSYSTE MDAC ID:				EPD&C 17 HIGH				en :	SW:	ІТСН	BLO	OCKING	DIO	DES	5	(2)	ı		
LEAD ANA	LY	ST	:	B. SL	AU	GH'	TER												
ASSESSME	'nт	:																	
	CR		ICAL: LIGH:			R	EDUND	AN	CY	SCRI	EENS	5		CI	-	Æ			
]	HD	W/FUI	NC		A			В			С				•			
NASA IOA			/1R /1R		[P P]	[P P]	[P] P]		[X]	*		
COMPARE	[N	/]	[]	[]	[3		[N]			
RECOMMEN	DA:	ric	ONS:	(If	đ	ifi	feren	t 1	fro	om NA	ASA)								
	[/]	[]	[]	[]	(AI	[)D/	DE] LE	TE)		
* CIL RE	TEI	T	ON F	ATION?	\LE	E :	(If	app	ol i	.cabl	Ţ	ADEQUA ADEQUA		<u>[</u>]			
REMARKS: SECOND F.	AII	LUF	RE CO	OULD AI	LC	W	GH2	го	EN	TER				ι IT		•			

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	MPS-018X	3		NASA DATA: BASELINE NEW	
SUBSYSTEM: MDAC ID: ITEM:	EPD&C/ME 18 FILL AND		LA1 MDM B	LOCKING DIO	DE (1)
LEAD ANALYST:	B. SLAUC	HTER			
ASSESSMENT:					
		REDUNDA	NCY SCREE	ns	CIL ITEM
FLIGH HDW/FU		A	В	С	
NASA [2 /1R IOA [3 /1R] [P] P]	[P] [P]	[P] [P]	[X] * []
COMPARE [N /] []	[]	[]	[N]
RECOMMENDATIONS:	(If d	ifferent	from NAS	A)	
[3 /1R] [P]	[P]	[P] (A	[D] DD/DELETE)
* CIL RETENTION	RATIONAL	E: (If a	applicable	e) ADEQUATE INADEQUATE	[]
REMARKS: FAILURE WILL ELI THE F/D VALVE. BLOCKING DIODES	SECOND F.	AILURE C	CANNOT CLO	A PREMATUR	E CLOSE OF

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	1/25/88 MPS-019X 2275-2	NASA I BASEI	DATA: LINE [] NEW [X]
SUBSYSTEM: MDAC ID: ITEM:	EPD&C/MPS 19 FILL AND DRAIN	LA1 MDM BLOCKING	DIODE (1)
LEAD ANALYST:	B. SLAUGHTER		
ASSESSMENT:			
CRITICAL FLIGH HDW/FU	T	ANCY SCREENS B C	CIL ITEM
NASA [3 /3 IOA [3 /3] [NA]] [NA]	[NA] [NA] [NA] [NA]	[] *
COMPARE [/] []	[] []	[]
RECOMMENDATIONS:	(If different	t from NASA)	
[/] []	[] []	[] (ADD/DELETE)
* CIL RETENTION I	RATIONALE: (If a	applicable) ADEQUA INADEQUA	

ASSESSMENT DA' ASSESSMENT ID NASA FMEA #:	: MPS-	/25/88 NASA DATA: IPS-020X BASELINE [278-1 NEW [X							
SUBSYSTEM: MDAC ID: ITEM:	EPD& 20 HIGH	•	NDM BLO	CKING DIOD	E (2)				
LEAD ANALYST:	B. S	LAUGHTER							
ASSESSMENT:									
	CALITY IGHT	REDUN	DANCY SCR	EENS	CIL ITEM				
	/FUNC	A	В	С					
NASA [2 IOA [2	/1R] /1R]	[P] [P]	[P] [P]	[P] [P]	[X] *				
COMPARE [/]	[]	[]	[]	[]				
RECOMMENDATIO	ns: (1	f differe	nt from N	ASA)					
[/]	[]	[]	[]	[] (ADD/DELETE)				
* CIL RETENTI	ON RATIO	ONALE: (If	applicab	le) ADEQUA INADEQUA	•				
REMARKS: SECOND FAILUR	E COULD	LEAD TO G	H2 INGEST	ION AT SSM	ME START.				

ASSESSMENT DATE: 1/25/88 ASSESSMENT ID: MPS-021X NASA FMEA #: 2278-2							NASA DATA: BASELINE [] NEW [X]									
SUBSYST MDAC ID ITEM:				21			LA:	l M	DM I	BLOCK:	IN:	G DIO	DE (2)		
LEAD AN	ALY	ST	:	В.	SLAU	GHT	ER									
ASSESSMI	ENT	:														
		F	ICAI LIGH W/FU	ΙΤ		REI A	DUNI	OAN(CY S	SCREE		c		CII	_	
NASA IOA	[3	/3 /3]]	NA NA]	[NA] NA]		[]	NA] NA]		[]	*
COMPARE	[/]	[-]	[]	([]		ι]	
RECOMMEN	IDA!	ric	ons:		(If d	iffe	eren	nt i	from	NASA	۲)					
	[/]	[]]	[]	(•]	(AI	[DD/D) ELE	ETE)
* CIL RE		(TV	ON	RAT:	IONAL	E: ((If	app	olic		7	ADEQUA ADEQUA		[]	

REMARKS:

ASSESSMENT DATE: 1/25/88 ASSESSMENT ID: MPS-022X NASA FMEA #: 202600-1 SUBSYSTEM: EPD&C/MPS												INE	: : [x]					
MDAC ID:				22	•		MO	IIN	'O1	R RES	ISTO	RS, 5.	1K	(3)				
LEAD ANA	LYS	ST:		В.	SLAU	GHT	ER											
ASSESSME	NT	:																
	CR:		CAL LIGH			RE	DUN	DAN		Y SCR	EENS			CII				
]	HDV	V/FU	NC		A				В		С						
NASA IOA	[[3 3	/3 /3]] [NA NA	.]	{	: :	NA] NA]]	NA] NA]		[]	*		
COMPARE	[/]	[1	Į	•]	(]		[3			
RECOMMEN	IDA'	ric	ons:		(If d	iff	ere	nt	f	rom N	ASA)						
	[/]	(]	1]	[]	(A	[.DD/[) DELE	ETE)		
* CIL RI	ETE:	NT:	ION	RAT	'IONAL	E:	(If	aj	qc	licab		ADEQUA NADEQUA		[]			

REMARKS:

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SUBSYSTI MDAC ID: ITEM:		EPD&C/M 23 MDM OA1					
LEAD ANA	ALYST:	B. SLAU	GHTER				
ASSESSME	ENT:						
	CRITICAL FLIGH		REDUND	ANCY SCRE	ENS	CIL	
	HDW/FU		A	В	С	ITE	M
NASA IOA	[3 /3] [NA]	[] [NA]	[] [NA]	[] *
COMPARE	[N /N] (N]	[N]	[N]	ι]
RECOMMEN	DATIONS:	(If d	ifferen	t from NA	SA)		
	[3 /3] [NA]	[NA]	-	[.DD/DI] ELETE)
* CIL RE	TENTION 1	RATIONAL	E: (If a	applicable	•	_	_
REMARKS.					ADEQUATE INADEQUATE	[]

THE FAILURE INHIBITS MONITORING

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	1/26/88 MPS-024X 2056A-2		NASA DATA: BASELINE NEW	
MDAC ID:	EPD&C/MPS 24 OPEN SWITCH E	BLOCKING DIOD	ÞΕ	
LEAD ANALYST:	B. SLAUGHTER			
ASSESSMENT:				
CRITICAL: FLIGHT HDW/FUI	r	IDANCY SCREEN B	rs C	CIL ITEM
•		_	י פ	f Y 1 *
NASA [3 /1R IOA [3 /1R] [P]] [P]	[F] [P]	[X] * [X]
COMPARE [/] []	[] []	[]
RECOMMENDATIONS:	(If differe	ent from NASA	<i>Y</i>)	
[/] []	[]	(A	[] DD/DELETE)
* CIL RETENTION	RATIONALE: (I		ADEQUATE	[]

REMARKS:

ASSESSMENT DATE: 1/26/88 ASSESSMENT ID: MPS-025X NASA FMEA #: 2354A-1					NASA DATA: BASELINE [] NEW [X]							
SUBSYSTEM: MDAC ID: ITEM:	:	EPD&C/I 25 LA1 MDI		SOLAT:	ION	DIODE						
LEAD ANALY	ST:	B. SLA	UGH'	TER								
ASSESSMENT	?:											
	FLIGHT		R	EDUNDA	ANCY	SCRE	ENS			IL TEN	1	
	HDW/FUI	4C	A		В		C	2				
NASA [2 /1R 3 /1R]	[P [P]	[P]	[F	'] ']	[X]	*
COMPARE [N /) ([]	[]	[]	[N]	
RECOMMENDATIONS: (If different from NASA)												
(/] ([]	[]	[/DE		TE:
* CIL RETE REMARKS: DIODE NOT								DEQUATE DEQUATE]]	
PIODE NOI	DITONIA C	M 4912-	741	.102,	OUT.	14.						

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SUBSYSTE MDAC ID:				26	D&C/MF 1 MDM		LAI	'ION	T [OIOD	E					
LEAD ANA	LYS	T:		в.	SLAUG	HTE	ER									
ASSESSME	NT:	i !														
CRITICALITY				REDUNDANCY SCREENS								CIL ITEM				
	ŀ		JIGH /FU			A			В			С				
NASA IOA	[3	/3 /3]	[[NA NA]]	NZ NZ	A] A]	[[NA]		[]	*
COMPARE	[/	3	[]	[1	[]		[)	
RECOMMENDATIONS: (If different from NASA)																
	[/	3	[]	[]	[]		[.DD/I		ETE)
* CIL RI	ETE!	NT:	ION	RAT	'IONAL	E:	(If	ap	pl	icab		ADEQ NADEQ	UATE UATE	_]	
REMARKS:	: OT	SH	OWN	ON	VS72-	941	102	, s	нт	14.	•					

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	1/25/88 MPS-027X 2355A-1		NASA DATA BASELINE NEW							
SUBSYSTEM: MDAC ID: ITEM:	EPD&C/MPS 27 OPEN SWITCH									
LEAD ANALYST:	B. SLAUGHTEI	R								
ASSESSMENT:	ASSESSMENT:									
CRITICALI FLIGHT	יי		CIL ITEM							
HDW/FUN	IC A	В	С							
NASA [2 /1R IOA [2 /1R] [P]	[P] [P]	[P] [P]	[X] * [X]						
COMPARE [/] []	[]	[]	[]						
RECOMMENDATIONS: (If different from NASA)										
[/] []	[]	[] (A	[] DD/DELETE)						
* CIL RETENTION R REMARKS: DIODE NOT SHOWN O			e) ADEQUATE INADEQUATE	[]						

ASSESSMEN ASSESSMEN NASA FMEA	NT ID:	: 1/25 MPS- 2355	028X			TA: NE [] EW [X]
SUBSYSTEM MDAC ID:	1:	EPD& 28 OPEN	C/MPS SWITCH B	LOCKING D	IODE	
LEAD ANA	LYST:	B. S	LAUGHTER			
ASSESSME	NT:					
	CRITICA FLIG	HT		DANCY SCR		CIL ITEM
	HDW/F	UNC	A	В	С	
NASA IOA	[2 /1 [3 /3	.R]	[F] [NA]	[F] [NA]	[P] [NA]	[X] * []
COMPARE	[N /N]	[N]	[N]	[N]	[N]
RECOMMEN	DATIONS	:: (I	f differe	nt from N	ASA)	
	[3 /3]	[NA]	[NA]	[NA]	[D] (ADD/DELETE)
* CIL RE	TENTION	RATIO	NALE: (If	applicab	le) ADEQUAT INADEQUAT	
REMARKS: SHORTING INFEASIB		OPEN	CONTACT T	O GROUND	IN THIS SW	ITCH IS

ASSESSMI ASSESSMI NASA FMI	ENT	ID:	MPS						NASA DAT BASELIN NE		x]
SUBSYSTE MDAC ID:			29	&C/MPS N MDM		LATIO	N DIC	DE			
LEAD ANA	LYS	T:	В.	SLAUGH	TER						
ASSESSME	:TN										
	CI!	_									
NASA IOA	[3 /3 3 /3]	[N.	A] A]	[]	NA] NA]	[NA] NA]	[] *
COMPARE	[/]	[]	[]	[]	[]
RECOMMEN	DAT	ions:	(If dif	fere	ent f	rom N	ASA)			
	[/]	[]	[]	[] DELETE)
* CIL RE	TEN	TION 1	RATI	ONALE:	(If	app:	licab	·	ADEQUATE ADEQUATE]

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	1/25/88 MPS-030X 2357A-2		NASA DATA BASELINE NEW	
SUBSYSTEM: MDAC ID: ITEM:	EPD&C/MPS 30 CLOSE SWITC	CH ISOLATION	DIODE	
LEAD ANALYST:	B. SLAUGHTI	ER		
ASSESSMENT:				
CRITICAL: FLIGH		DUNDANCY SCRE	ENS	CIL ITEM
HDW/FU	_	В	С	
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ASSESSMENT DATE: 1/26/88

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LEAD ANA	LYST:	B. SLA	UGH	TER										
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SUBSYSTEM MDAC ID: ITEM:	l:	EPD&C/N 35 SWITCH		LEED RESIS	STORS, 1.8K	(2)
LEAD ANAL	YST:	B. SLAU	JGHTER			
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SUBSYSTE MDAC ID: ITEM:		EPD&C/MI 36 MDM OA2	PS .				
LEAD ANA	LYST:	B. SLAU	GHTER				
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LEAD ANALYST:	B. SLAU	GH'	TER .											
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ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	1/28/88 MPS-042X 2240A-2		NASA DATA: BASELINE NEW	
SUBSYSTEM: MDAC ID: ITEM:	EPD&C/MPS 42 DIODE, RPC	CROSSOVER		
LEAD ANALYST:	B. SLAUGHTE	ER		
ASSESSMENT:				
CRITICAL FLIGH	T	OUNDANCY SCREE B	ns C	CIL ITEM
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LEAD ANA	LYST:	B. SLA	UGHT	ER					
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SUBSYSTEM MDAC ID:	M:	EPD&C/MI 46 POSITION		TOR SWIT	СН	
LEAD ANA	LYST:	B. SLAUC	SHTER			
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	CRITICAL FLIGH HDW/FU	T	REDUNDA A	B	ENS C	CIL
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SUBSYSTEM: MDAC ID: ITEM:	EPD&C/MPS 53 DIODE, CLOSI	ODE, CLOSING CROSSOVER										
LEAD ANALYST:	B. SLAUGHTER											
ASSESSMENT:												
CRITICAL FLIGH HDW/FU	r	NDANCY SCREENS B C	CIL ITEM									
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* CIL RETENTION I	RATIONALE: (I	f applicable) ADEQUATE INADEQUATE										

FAILURE CAN SHORT ALL CLOSING COMMANDS TO GROUND, PREVENTING VALVE CLOSURE. ET SEP WITH VALVE OPEN CAN CAUSE LOSS OF VEHICLE. MECHANICAL LINKAGE PROVIDES REDUNDANCY.

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ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	MPS-057X		NASA DATA BASELINE NEW	
SUBSYSTEM: MDAC ID: ITEM:	57	N CROSSOVER		
LEAD ANALYST:	B. SLAUGHT	ER		
ASSESSMENT:				
CRITICALI FLIGHT		DUNDANCY SCRE	ENS	CIL ITEM
HDW/FUN		В	С	ITEM
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REMARKS: FAILURE CAN SHORT PRESSURE AND ALLO BISTABLE FEATURE	WING VALVE	TO CLOSE DUR	ING MAIN ENG	INE BURN.

CLOSURE.

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SUBSYSTEM MDAC ID:			58	C/MPS		SWI	TCH M	rINO	OR RES	ISTO	OR (1)	
LEAD ANA	LYST	:	в. 8	SLAUG	HTER								
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ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	1/21/88 MPS-059X 2244-2			NASA DATA BASELINE NEW	
SUBSYSTEM: MDAC ID: ITEM:	EPD&C/MPS 59 OPEN HDC,		I (2)		
LEAD ANALYST:	B. SLAUGH	TER			
ASSESSMENT:					
CRITICAL FLIGH HDW/FU	r	EDUNDANC	SCREI	ens C	CIL ITEM
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	2/08/88 MPS-067 2101-3			NASA DATA BASELINE NEW	[]
SUBSYSTEM: MDAC ID: ITEM:	EPD&C/M 67 CLOSE H				
LEAD ANALYST:	B. SLAU	GHTER			
ASSESSMENT:					
CRITICAL FLIGH HDW/FU	T	REDUNDAN A	CY SCREE	NS C	CIL ITEM
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THIS ASSESSMENT IS FOR THE ABORT CASE ONLY. INADVERTENT POWER TO THE CLOSE SOLENOID DOES NOT CAUSE A LOSS OF CLOSE SOLENOID POWER.

ASSESSME	NT DAT				NASA D		
ASSESSME NASA FME		MPS NA	5-068X		BASEI	INE [x]
SUBSYSTE MDAC ID: ITEM:	M:	68	0&C/MPS				
LEAD ANA	LYST:	В.	SLAUGHTE	R			
ASSESSME	NT:						
	CRITIC	ALITY	RED	UNDANCY SO	CREENS	CI	L EM
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ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	1/27/88 MPS-069X 2026-1	BASELINE []										
SUBSYSTEM: MDAC ID: ITEM:	EPD&C/MPS 69 HDC - GND		OMMAND F	POWER (5)								
LEAD ANALYST:	B. SLAUGH	ITER										
ASSESSMENT:												
CRITICAI FLIGH HDW/FU	IT		NCY SCRE	ENS C	CIL ITEM							
NASA [3 /3 IOA [3 /3] [N		[NA] [NA]	[NA] [NA]	[] *							
COMPARE [/] []	[]	[]	[]							
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* CIL RETENTION REMARKS:	RATIONALE:	(If a	pplicabl	e) ADEQUATE INADEQUATE	[]							

ASSESSMENT DAT ASSESSMENT ID: NASA FMEA #:		'OX		NASA DAT BASELIN NE	
SUBSYSTEM: MDAC ID: ITEM:	EPD&C/ 70 HDC -		COMMAND P	OWER (5)	
LEAD ANALYST:	B. SL	AUGHTER			
ASSESSMENT:					
CRITIC		REDUN	DANCY SCRE	EENS	CIL ITEM
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REMARKS:

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SUBSYSTEM: MDAC ID: ITEM:	EPD&C/M 71 MONITOR		ORS (3)								
LEAD ANALYST:	B. SLAU	GHTER									
ASSESSMENT:											
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ASSESSMENT DATE: 1/27/88 ASSESSMENT ID: MPS-072X NASA FMEA #: 2031-1 SUBSYSTEM: EPD&C/MP															SA DAT ASELIN NI			x]	
SUBSYSTE MDAC ID: ITEM:				72	•			SUPI	PRE	SS	3 I (DI NC	OD	ES	(3)					
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LEAD AN	ALYST	r:	В.	SLAUG	HTER							
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SUBSYSTEM MDAC ID:	I:			71	C/MI		CON	ITROL	POW	ER (3)			
LEAD ANAI	LYS	T:		в.	SLAU	GHT	ER						
ASSESSMEN	1T:												
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LEAD ANA	ALYST:	B. SLAU	SHTER			
ASSESSME	ENT:					
	CRITICALI FLIGHT		REDUNDAN	NCY SCR	REENS	CIL
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LEAD ANA	LYST:	В.	SLAU	GH?	rer									
ASSESSME	NT:													
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ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	1/27/88 MPS-081X 2035-2		NASA DATA BASELINE NEW	
SUBSYSTEM: MDAC ID: ITEM:	EPD&C/MPS 81 TOGGLE SWITCH	н		
LEAD ANALYST:	B. SLAUGHTER			
ASSESSMENT:				
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LEAD ANALYST	: B. SI	AUGHTER			
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ASSESSM	ENT	:																
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ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	2/10/88 MPS-092X 2340-2			NASA DATA: BASELINE NEW	
SUBSYSTEM: MDAC ID: ITEM:	EPD&C/MPS 92 LOCK RPC (2)			
LEAD ANALYST:	B. SLAUGHT	ER			
ASSESSMENT:					
CRITICAL		EDUNDANC	CY SCREE	NS	CIL ITEM
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* CIL RETENTION	RATIONALE:	(If ap	plicable	e) ADEQUATE INADEQUATE	[]
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ASSESSMENT DAT ASSESSMENT ID: NASA FMEA #:	MPS-093	3 3 X			NASA DA BASELI N]
SUBSYSTEM: MDAC ID: ITEM:	EPD&C/N 93 UNLOCK					•	•
LEAD ANALYST:	B. SLAU	GHTER					
ASSESSMENT:							
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* CIL RETENTION	RATIONALE	E: (If a	ppli	cable	∍)		
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ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	2/10/88 MPS-095X 2342-1			NASA DATA BASELINE NEW	
SUBSYSTEM: MDAC ID: ITEM:	EPD&C/MPS 95 LOCK HDC				
LEAD ANALYST:	B. SLAUGH	łter			
ASSESSMENT:					
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ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	MPS-098X			NASA DATA: BASELINE NEW	
SUBSYSTEM: MDAC ID: ITEM:	EPD&C/MPS 98 UNLOCK HD				
LEAD ANALYST:	B. SLAUGH	TER			
ASSESSMENT:					
	ITY R	EDUNDANG	CY SCREE	NS	CIL ITEM
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COMPARE [/] [] []	[]	[]
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* CIL RETENTION	RATIONALE	: (If ap) ADEQUATE INADEQUATE	[]
REMARKS: NASA FMEA NO. 05 THAT THIS ITEM I	5-6J-2343- FAILS SCRE	2 REV. 1 EN B. T	0/10/87 HIS TEXT	CONTAINS TE	XT EXPLAINING DELETED.

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ASSESSME	NT:																
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LEAD ANALYST:	B. SLAUG	SHTER				
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NEW [X]	
SUBSYSTEM: EPD&C/MPS MDAC ID: 111 ITEM: LOCK RPC CROSSOVER DIODE	
LEAD ANALYST: B. SLAUGHTER	
ASSESSMENT:	
CRITICALITY REDUNDANCY SCREENS CIL FLIGHT ITEM	
HDW/FUNC A B C	
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* CIL RETENTION RATIONALE: (If applicable)	
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NASA FMEA NO 05-6J-2348-3 REV 11/04/87 CONTAINS TEXT EXPLAINI THAT THIS ITEM FAILS SCREEN B. THIS TEXT SHOULD BE DELETED.	NG

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SUBSYSTEM: EPD&C/MPS MDAC ID: 114 UNLOCK RPC CROSSOVER DIODE LEAD ANALYST: B. SLAUGHTER ASSESSMENT: CRITICALITY REDUNDANCY SCREENS CIL ITEM FLIGHT HDW/FUNC A B C NASA [2 /1R] [P] [P] [P] [X] * IOA [2 /1R] [P] [P] [P] [X] COMPARE [/] [] [] [] [] RECOMMENDATIONS: (If different from NASA) [/] [] [] [] [] * CIL RETENTION RATIONALE: (If applicable) ADEQUATE [] DEWARDS:	ASSESSMEN ASSESSMEN NASA FME	NT	ID	:	MP	10/8 S-11 49-3	8 4 X								SA DA' ASELI N]	
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LEAD ANALYST:	B. SLAUG	HTER		
ASSESSMENT:				
CRITICAL FLIGHT	r	REDUNDANCY SCRE	Ens	CIL ITEM
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LEAD ANALYST:	B. SLAU	GHTER			
ASSESSMENT:					
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ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	MPS-121X		NASA DATA BASELINE NEW	
MDAC ID:	EPD&C/MPS 121 LOCK RPC B	OUTPUT DIODE		
LEAD ANALYST:	B. SLAUGHT	ER		
ASSESSMENT:				
CRITICAL FLIGH HDW/FU	r	DUNDANCY SCREE		CIL ITEM
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LEAD ANAL	YST:	B. S	LAUGH	rer						
ASSESSMEN	T:									
C	RITICA FLIC HDW/I	HT	RI A	EDUN	DANCY B	SCRE	ENS C		CIL	М
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ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	MPS-131X			TA: NE [] EW [X]
MDAC ID:	EPD&C/MPS 131 LH2 PREVA		COMMAND B RPC	OUTPUT DIODES,
LEAD ANALYST:	B. SLAUGH	TER		
ASSESSMENT:				
CRITICALI FLIGHT		EDUNDANCY	SCREENS	CIL ITEM
HDW/FUN	C A	В	C	
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ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	1/29/88 MPS-136X 2208-2	NASA DAT BASELII N	
SUBSYSTEM: MDAC ID: ITEM: (3)	EPD&C/MPS 136 LH2 PREVALVES	CLOSE RPC CROSSOVER	DIODES, 12A
LEAD ANALYST:	B. SLAUGHTER		
ASSESSMENT:			
CRITICAL: FLIGH		DANCY SCREENS	CIL ITEM
HDW/FU	NC A	ВС	
NASA [3 /1R IOA [3 /1R] [P]] [P]	[F] [P] [F] [P]	[X] * [X]
COMPARE [/] []	[] []	[]
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* CIL RETENTION	RATIONALE: (If	applicable) ADEQUAT INADEQUAT	•

SUBSYSTEM: EPD&C/MPS MDAC ID: 137 ITEM: LH2 PREVALVE CLOSE RPC CROSSOVER DIODE, 12A LEAD ANALYST: B. SLAUGHTER ASSESSMENT: CRITICALITY REDUNDANCY SCREENS CIL	
ASSESSMENT:	(3)
CDIMICALIMY DEDIMONNOV CODEENS CTT	
CRITICALITY REDUNDANCY SCREENS CIL FLIGHT ITEM	
HDW/FUNC A B C	
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COMPARE [/] [] [] []	
RECOMMENDATIONS: (If different from NASA)	
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* CIL RETENTION RATIONALE: (If applicable) ADEQUATE [] INADEQUATE [] REMARKS:	

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SUBSYSTEM MDAC ID:	1:			120	&C/MF PREV		OPE	MDM r	BLO	CKING D	IODE	s (3)	
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SUBSYSTE MDAC ID:	M:		139	C/MI		CL	OSE MI	DM B	LOCKING	DIODE	S (3)
LEAD ANA	LYS	T:	B. S	LAUG	HTER						
ASSESSME	NT:										
		TICAL FLIGH	T			DAN(CY SCI	REEN	S	CII ITI	
	Н	DW/FU	NC		A		В		С		
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REMARKS:								IN	ADEQUAT]

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LEAD ANA	LYS	ST	:	в.	SLAUC	HTE	R						
ASSESSME	NT:	:											
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SUBSYSTIMDAC ID:				141			CLO	SE MDM	BL	OCKING	DIO	DES	(3)	
LEAD AND	ALY	ST	:	В.	SLAU	SHTER								
ASSESSMI	ENT	:												
		F	ICAL LIGH W/FU			REDUI	NDAN(CY SCR	EENS	c c		CII ITI		
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ASSESSME ASSESSME NASA FME	NT	ID			-142X	3				NASA D BASEL		[k]
SUBSYSTE MDAC ID:	M:			142	&C/MI PREV		MA	(NSTAG)	E B1	OCKING	DIC	ODE	5 (6)
LEAD ANA	LYS	ST:	:	В.	SLAUG	HTER							
ASSESSME	NT:	:											
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	1	HDV	/FU	NC		A		В		С			
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ASSESSMENT:													
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SUBSYSTEM: MDAC ID: ITEM: DIODES (3)	EPD&C, 144 LH2 PI		CLOSE	SWITCH	COMMAND A	BLOCKING
LEAD ANALYST:	B. SL	AUGHTER				
ASSESSMENT:						
	ALITY GHT	REDUI	NDANCY	SCREEN	S	CIL ITEM
	FUNC	A	В		С	
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REMARKS: THE FAILURE I	S NOT DET	ECTABLE				

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	2/01/88 MPS-145X 2216-2			: [
	EPD&C/MPS 145 LH2 PREVALVES	OPEN SWITCH	COMMAND C	BLOCKING
LEAD ANALYST:	B. SLAUGHTER			
ASSESSMENT:				
CRITICALI FLIGHT HDW/FUN	נ	DANCY SCREEN: B	s c	CIL ITEM
NASA [3 /1R IOA [3 /1R] [P]] [P]	[P] [[F] [P] P]	[] *
COMPARE [/] []	[N]	1	[N]
RECOMMENDATIONS:	(If differe	nt from NASA)	
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REMARKS THE FAI		E	IS N	от	DET	EC	TA:	BLE.													

ASSESSMEN ASSESSMEN NASA FME	NT ID:	2/01/88 MPS-147 2218-2			NASA DATA BASELIN NE	
SUBSYSTEMDAC ID: ITEM: (6)		EPD&C/M 147 LH2 PRE		CLOSE SWI	ITCH B&C BLOO	CKING DIODES
LEAD ANA	LYST:	B. SLAU	GHTER			
ASSESSME	NT:					
(CRITICAL FLIGH HDW/FU	T	REDUNI A	DANCY SCRE	C C	CIL ITEM
NASA IOA	[3 /1R [3 /1R] [P] P]	[P] [F]	[P] [P]	[] * [x]
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COMPARE	[/]		[]	[]	[]		[]	
RECOMMEN	DAT	ri	ON	s:		(If	d:	if1	fere	nt	fr	om N	ASA)						
	[/]		[]	[]	[]	(A	[DD/	'DE] ELF	ETE)
* CIL RE	TEN	T:	10	N I	RAI	ION?	LI	ያ:	(If	ap	pl:	icab:			_	JATE JATE	[]	
REMARKS:																	•		_	

	2/01/88 MPS-150X 2221-2		A DATA: SELINE [] NEW [X]	
	EPD&C/MPS 150 LH2 PREVAL	VES CLOSE	SWITCH SCA	AN DIODES (9)
LEAD ANALYST:	B. SLAUGHT	ER		
ASSESSMENT:				
CRITICAL: FLIGHT HDW/FUI	r	DUNDANCY B	SCREENS C	CIL
NASA [3 /1R IOA [3 /1R] [P [P] [F]] [P]	[X] * [X]
COMPARE [/] [] [] []	[]
RECOMMENDATIONS:	(If diff	erent fro	om NASA)	
[/] [] [] []	[] (ADD/DELETE)
* CIL RETENTION :	RATIONALE:	(If appli	ADE	QUATE [] QUATE []

ASSESSMI ASSESSMI NASA FMI	ENT	I	D:	MI	/01/88 PS-151 392-2			NASA DATA: BASELINE [] NEW [X]								
SUBSYSTI MDAC ID: ITEM: (3)				15			LVES	OP:	EN	COM	MAND	A	RPC (OUTP	UT	DIODES
LEAD ANALYST: B. SLAUGHTER																
ASSESSME	ENT	:														
		F	ICAL	Г				DAN		SCR	EENS				IL FEI	1
]	HD	W/FUI	NC		A			В			С				
NASA IOA	[3	/1R /1R]]	P P]	[F F]	[P :]]	X X] *]
COMPARE	[/]	[]	[]	[•	l	[]
RECOMMEN	IDA'	rI(ons:		(If d	if	fere	nt :	fro	om N	ASA)					
	[/]	[]	[]	[]			/DI] ELETE)
* CIL RE		NT:	ION I	RAT	'IONAL	E:	(If	app	91 i	icab:	•		EQUATI EQUATI]

ASSESSME ASSESSME NASA FME	NT	II		MP	01/8 S-15 92-3	2 X	3								SA DA BASELI N		[]	
SUBSYSTE MDAC ID: ITEM: (3)	М:			15	D&C/ 2 2 PR			VES	ΟP	EN	,	COMMA	NI) A	RPC	נעס	PUT	DI	ODES
LEAD ANA	LYS	ST:	:	в.	SLA	UG	THE	'ER											
ASSESSME	NT:	:																	
	CR.		ICAL:				RE	EDUNE	AN	CY	•	SCREI	ENS	3			CIL	M	
	1		W/FU				A			E	3			С					
NASA IOA	[3	/1R /1R]		[P P]	[F	>]	[P P]		[]	*
COMPARE	[/]		[1	(]	[]		ſ]	
RECOMMEN	IDA	TI	ons:		(If	d :	if	fere	nt	fı	cc	m NA	SA)					
	[/]		[]	!]	[]	(A	[DD/D	ELI	ETE)
* CIL RI	ETE	NT	ION	RAT	CION	ΑL	E:	(If	aj	gc.	Li	cabl			DEQUA' DEQUA'		[]	

ASSESSMENT DA ASSESSMENT ID NASA FMEA #:	TE: 2/01/88 MPS-153X 2393-2	NASA DATA: BASELINE [] NEW [X]							
SUBSYSTEM: MDAC ID: ITEM: (3)	EPD&C/MPS 153 LH2 PREVALVES	S CLOSE COMMAND B RPC (OUTPUT DIODES						
LEAD ANALYST:	B. SLAUGHTER								
ASSESSMENT:									
FL	ALITY REDUM GHT FUNC A	NDANCY SCREENS B C	CIL ITEM						
		_	[X] *						
ioa į 3	1R] [P]	[F] [P] [F] [P]	[X] * [X]						
COMPARE [] []	[] []	[]						
RECOMMENDATION	S: (If differe	ent from NASA)							
[,] []	[] [] (A	[] ADD/DELETE)						
* CIL RETENTION REMARKS:	N RATIONALE: (If	applicable) ADEQUATE INADEQUATE	[]						

ASSESSMEN ASSESSMEN NASA FMEA	T :	ID		MPS	2/01/88 MPS-154X 2393-3				NASA DATA: BASELINE [] NEW [X]								
SUBSYSTEM MDAC ID: ITEM: (3)	1:				0&C/1 1 2 PR			VES	CLO	SE	CO	(AMN	ΙD	B RPC	OU	TPUT	DIODES
LEAD ANA	LYS	T:		в.	SLA	ŪG	НТ	ER									
ASSESSME	T:																
•	CRI		CAL				RE	DUNI	OANC	CY	SCR	EEN	S			CIL ITEN	ſ
	H	_	JIGH V/FU				A			В			С				
NASA IOA	[3	/1R /1R]		[P P]	[P P]	[P P]		[] *]
COMPARE	[/]		[]	[]	[3		[]
RECOMMEN	DA!	rI(ons:		(If	d :	ifi	fere:	nt	fr	om N	IASA	.)				
	[/	1		[3	[3	[]	(Al	ם/סכ] ELETE)
* CIL RE	ETE:	NT	ION	RA'	TION	AL	E:	(If	ap	pl	icak		•	DEQUAT DEQUAT		[]

ASSESSM ASSESSM NASA FM	ENT	'I	D:	1/ MP 05	S-201	201X BASELINE ()									
SUBSYST: MDAC ID ITEM:				MP: 20: LO:	1	K PRE	-PRE	SS CH	IECK '	VALVE	(CV1	6)			
LEAD AND	ALY	ST	:	W.S	J. MC	NICOL	<u></u>								
ASSESSMI	ENT	:													
	CR		ICA LIGI	LITY HT		REDUI	NDAN(CY SC	REENS	5			IL TEI		
	J	HD	W/FT	JNC		A		В		С		1	I E	.71	
NASA IOA	[[1	/1 /1]] [NA] NA]		NA] NA]	-	NA] NA]		[x]	*
COMPARE	[/]	[3	[]	[]		[N	3	
RECOMMEN	[AD]	ric	ons:	• (If di	ffere	nt i	from 1	NASA)						
	[/	-	[-	ſ]	[]	(AD	[D/	/DF] ELE	ETE)
* CIL RE	TEN	ITI	NO	RATI	ONALE	: (If	app	licak							
REMARKS:										ADEQU. ADEQU.		[]	
EXTERNAL OVERPRES TANK DUE NASA INFO	TO	A	TMO	ON O	r THE RIC F	AFT ORCES	COMP ACT	ARTME	33700 3						HE LO2

NASA INFORMATION IS BASED ON THE RI/NASA CRITICAL ITEMS LIST OF

12-23-87.

ASSESSMENT DA ASSESSMENT ID NASA FMEA #:	: MPS-202	IPS-202X BASELINE [
SUBSYSTEM: MDAC ID: ITEM:	MPS 202 LO2 BLE	22 BLEED CHECK VALVE (CV31, 33, 35)						
LEAD ANALYST:	W.J. MC	CNICOLL						
ASSESSMENT:								
CRITI FI	ns	CIL ITEM						
HDW	/FUNC	A	В	С				
NASA [3 IOA [3	/3] [/3]	NA] NA]	[NA] [NA]	[NA] [NA]	[] *			
COMPARE [/ 1]	[]	[]	[]			
RECOMMENDATIO	ONS: (If	differen	t from NAS	A)				
ſ	/ 1	[]	[]	[] (A)	[] DD/DELETE)			
* CIL RETENTI	ON RATIONA	LE: (If	applicable	adequate	•			
REMARKS: RI/NASA ANALY	SIS APPLIES	TO REE	NTRY PURGE	-	-			
CONTAMINATION NASA INFORMAT (REF. J.E. BO	N TO ENTER '	THE SYST	EM.					

ASSESSMENT ID: NASA FMEA #:	MPS-203	x		NASA DATA BASELINE NEW	=
SUBSYSTEM: MDAC ID: ITEM:	MPS 203 LO2 BLE	ED CHECK	VALVE (CV31,33,35)	
LEAD ANALYST:	W.J. MC	NICOLL			
ASSESSMENT:					
CRITICA FLIC	LITY	REDUNDA	NCY SCRE	ens	CIL ITEM
HDW/I	UNC	A	В	С	
NASA [1 /1 IOA [1 /1	.] [NA] NA]	[NA] [NA]	[NA] [NA]	[X] *
COMPARE [/] [1	[]	[]	[N]
RECOMMENDATIONS	: (If d	ifferent	from NAS	SA)	
[/] []	[]	[]	[] DD/DELETE)
* CIL RETENTION	RATIONAL	E: (If a	pplicable	•	
200				ADEQUATE INADEQUATE	[]
REMARKS: NASA INFORMATION 12-23-87 AND THE					

ASSESSMENT ASSESSMENT NASA FMEA	r ID:	1/20/88 MPS-204 0519-5	x		NASA DATA: BASELINE NEW	
SUBSYSTEM MDAC ID: ITEM:	•	MPS 204 GO2 PRE	SSURE FI	LOW CONTRO	L VALVE (LV	53,54,55)
LEAD ANAL	YST:	W.J. MC	NICOLL			
ASSESSMEN	T:					
С	RITICAL FLIGH		REDUNDA	ANCY SCREE		CIL ITEM
	HDW/FU	NC	A	В	С	
NASA IOA	[1 /1 [1 /1] [NA]	[NA] [NA]	[NA] [NA]	[X] * []
COMPARE	[/] [1	[]	[]	[N]
RECOMMEND	ATIONS:	(If o	lifferen	t from NAS	SA)	
	[/]	[]	[]	[] (A	[] ADD/DELETE)
* CIL RET	PENTION	RATIONA:	LE: (If	applicable	e) ADEQUATE INADEQUATE	
REMARKS: REF: RI	/NASA FM	EA/CIL	REVIEW M	EETING NO	res.	

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	1/21/88 MPS-2053 0408-5	MPS-205X BASELINE					
	MPS 205 LO2 FEE	D (ORB/ET) DISCON	NECT (PD1)			
LEAD ANALYST:	W.J. MCI	NICOLL					
ASSESSMENT:							
CRITICALI FLIGHT	[REDUNDAN	CY SCREEN	ıs	CIL ITEM		
HDW/FUN	ic	A	В	С			
NASA [1 /1 IOA [1 /1] [NA] [NA] [NA] [NA]	NA] NA]	[X] * []		
COMPARE [/] [] [] []	[и]		
RECOMMENDATIONS:	(If di	fferent i	rom NASA	١)			
1) [) [] [] (AI	[] DD/DELETE)		
* CIL RETENTION R	ATIONALE	: (If app	•	ADEQUATE NADEQUATE	[]		
REMARKS: REF: RI/NASA CIL 87.	OF 12-2	3-87 AND	RI/NASA	CIL WORKSHE	ET OF 12-15-		

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	MPS-206X		NASA DATA: BASELINE NEW	
	MPS 206 LO2 FEED	(ORB/ET) DISCO	NNECT (PD1)	
LEAD ANALYST:	W.J. MCNI	COLL		
ASSESSMENT:				
CRITICAL FLIGH		EDUNDANCY SCRE	ens	CIL ITEM
HDW/FU		В	С	
NASA [2 /1R IOA [2 /1R	[P	[F] [F]	[P] [P]	[X] *
COMPARE [/] [] []	[]	[N]
RECOMMENDATIONS:	(If dif	ferent from NA	SA)	
[/] [] []	[] (A	[] DD/DELETE)
* CIL RETENTION	RATIONALE:	(If applicabl	e) ADEQUATE INADEQUATE	[]
REMARKS: REF: RI/NASA CI	L OF 12-23	-87 AND RI/NAS	A CIL WORKSH	EET OF 12-15-

ASSESSMENT ID: NASA FMEA #:	MPS-207X	MPS-207X BASELINE [
	MPS 207 LO2 FEED (ORE							
LEAD ANALYST:	W.J. MCNICOLI	.J. MCNICOLL						
ASSESSMENT:								
CRITICAL: FLIGH	r	DANCY SCREENS	CIL ITEM					
HDW/FU	NC A	ВС						
NASA [1 /1 IOA [3 /3] [NA]] [NA]	[NA] [NA] [NA] [NA]	[X] * []					
COMPARE [N /N] []	[] []	[א]					
RECOMMENDATIONS:	(If differe	ent from NASA)						
[3 /3] [NA]	[NA] [NA]	[D] (ADD/DELETE)					
* CIL RETENTION 1	RATIONALE: (If	applicable)						
REMARKS:		ADEQUA						
	IS ADDRESSED AVE NO EFFECT.	ON 0408-6. FAILURE	OF THE					
		AND RI/NASA CIL WOR	KSHEET OF 12-15-					

ASSESSMEN ASSESSMEN NASA FMEA	T ID:		3X	A: E [] W [X]							
SUBSYSTEM MDAC ID:		MPS 208 LO2 FEE									
LEAD ANAI	LYST:	W.J. MC	CNICOLL								
ASSESSMEN	T:										
C	FLIGH			ANCY SCR		CIL ITEM					
	HDW/FU	JNC	A	В	С						
NASA IOA	[1 /1 [1 /1]	[NA] [NA]	[NA] [NA]	[NA] [NA]	[X] * []					
COMPARE	[/]	[]	[]	[]	[и]					
RECOMMENI	DATIONS	: (If o	differen	t from N	ASA)						
	[/]	[]	[]	[]	[ADD/DELETE)					
* CIL RET	TENTION	RATIONA	LE: (If	applicab	le) ADEQUATE INADEQUATE						
REMARKS: REF: RI, 87.	/NASA C	IL OF 12	-23-87 A	ND RI/NA	SA CIL WORKS	HEET OF 12-15-					

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	MPS-209X	NASA DATA: BASELINE [] NEW [X]								
MDAC ID:	MPS 209 LO2 FEED	DISCO	NNEC	T (PD:	1)					
LEAD ANALYST:	W.J. MCNI	COLL								
ASSESSMENT:										
CRITICAL FLIGH	ITY F	REDUNDA	ANCY	SCRE	ENS		_	CIL		
HDW/FU		1	В		С			TE	M	
NASA [/1R IOA [/] []	[]	[]	[X]	*
COMPARE [/N] []	[]	[]	[N	J	
RECOMMENDATIONS:	(If dif	ferent	t fr	om NAS	5 A)					
[/] []	[]	[] Ida(D D/D		ETE)
* CIL RETENTION	RATIONALE:	(If a	appl	icable	-					
REMARKS:					INA	DEQUATE DEQUATE	: [: []	
THIS FAILURE MODE POSITION INDICATE REF: RI/NASA CI	ION, OR 04	08-10,	SIDEI , ERI	RED UN RONEOU	IDER JS IN	0408-5 NDICATI	ON.	.os	s c	OF

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	1/21/88 MPS-210X 0454-2	PS-210X PASEDINE (454-2 NEW [
SUBSYSTEM: MDAC ID: ITEM: ONLY)	MPS 210 LO2 AND	02 AND LH2 FEED DISCONNECT LATCH ASSE							
LEAD ANALYST: W.J. MCNICOLL									
ASSESSMENT:									
CRITICALITY REDUNDANCY SCREENS CIL FLIGHT ITEM									
HDW/FU	NC	A	В	С					
NASA [1 /1 IOA [1 /1] [NA] [NA] [NA] [NA] [NA] NA]	[X] * []				
COMPARE [/] [] [] [1	[N]				
RECOMMENDATIONS:	(If d	ifferent :	from NASA	A)					
[/] [] [) [[] (A	[] DD/DELETE)				
* CIL RETENTION	RATIONAL	E: (If ap) ADEQUATE INADEQUATE					
REMARKS: REF: RI/NASA C 87.	IL OF 12-	·23-87 AND	RI/NASA	CIL WORKSH	EET OF 12-14-				

ASSESSMI ASSESSMI NASA FMI	ENT	I	D:	E: 1/21/88 MPS-211X 0454-3					NASA DATA: BASELINE [] NEW [X]							
SUBSYSTI MDAC ID: ITEM: ONLY)				M 2 L	11	LH	2 FEEI) D	ISC	ONNECT	' LATCH	ASSI	EMBI	LY (ORB		
LEAD ANA	LYS	T	:	W	.J. MC	NIC	OLL									
ASSESSME	ENT:	;														
	CRI		ICAL LIGH		Y	REI	OUNDAN	CY	SCI	REENS		C]	L EM			
	H	(D	/FU	NC		A		В		С			. EM			
NASA IOA	[2 2	/1R /1R]	[P]] [P P]	[P]	[х <u>ј</u>	*		
COMPARE	[/]	[]	[]	[]	[и ј			
RECOMMEN	DAT	IC	ons:		(If di	ffe	rent	fro	om N	IASA)						
	[/	3	[]	[]	[[ADD/] DEL	ETE)		
* CIL RE	TEN'	TI	ON F	TAS	'IONALE	: (If ap	pli	.cab	le)						
REMARKS:										INAI	DEQUATE DEQUATE	į]			
REF: RI,	/NA:	SA	CII	0	F 12-2	3-8	7 AND	RI	/NA	SA CII	WORKS	HEET	OF	12-15-		

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:			NASA DATA: BASELINE [] NEW [X]						
SUBSYSTEM: MDAC ID: ITEM: ONLY)	MPS 212 LO2 AND I	LH2 FEED	DISCONN	ECT LATCH A	ASSEMBLY (ORB				
LEAD ANALYST:	W.J. MCN	ICOLL							
ASSESSMENT:									
CRITICA FLIG		REDUNDANC	Y SCREE	ens	CIL ITEM				
HDW/F		A	В	С					
NASA [2 /1: IOA [2 /1:	R] []	P] [P] [F] F]	[P] [P]	[X] * []				
COMPARE [/] [] []	[]	[и]				
RECOMMENDATIONS	: (If di	fferent i	from NAS	SA)					
[/] [] [1	[]	[] ADD/DELETE)				
* CIL RETENTION	RATIONALE	: (If app	plicable	e) ADEQUATE INADEQUATE	-				
REMARKS: REF: RI/NASA C	IL OF 12-2	3-87 AND	RI/NASA	A CIL WORKS	HEET OF 12-15-				

ASSESSME ASSESSME NASA FME	NT I	D:	MPS-2	13X			NASA DATA: BASELINE [] NEW [X]								
SUBSYSTE MDAC ID: ITEM: ONLY)			MPS 213 LO2 A	ND	LH2 I	FEED D	ISCO	NNECT	LATCH	ASSEI	MBL)	(ORB			
LEAD ANA	LYST	:	W.J.	MCN	ICOLI										
ASSESSME	NT:														
		ICAL: LIGH			REDUN	IDANCY	SCR	REENS		CII					
		W/FU	_		A	В		С		ITI	ZM				
NASA IOA	[2 [2	/1R /1R]	[P] P]	[P [P]	[P]	[2	()]	*			
COMPARE	[/	3	[3	(]	[]	[1	1]				
RECOMMEN	DATI	ons:	(If	di	ffere	ent fro	om N	(ASA)							
	[/]	[]	[]	[]	[(ADD/I] DELE	TE)			
* CIL RE	TENT	ION 1	RATION	ALE	: (If	appli	icab	Al	DEQUATE DEQUATE]				
REMARKS: REF: RI	/NAS	A CI	L OF 1:	2-2	3-87	AND R	/NA	SA CI	L WORKS	SHEET	OF	12-15-			

ASSESSMENT ASSESSMENT NASA FMEA #	DATE: ID: :	1/21/88 MPS-214X 0454-6		NASA DATA: BASELINE [] NEW [X]								
SUBSYSTEM: MDAC ID: ITEM: ONLY)		MPS 214 LO2 AND										
LEAD ANALYS	T:	W.J. MCN	ICOLL									
ASSESSMENT:												
	TICAL:		REDUNDAN	CY SCREE	ns	CIL ITEM						
		NC	A	В	С							
NASA [IOA [1 /1 3 /3] [NA] [NA] [NA] NA]	[NA] [NA]	[X] *						
COMPARE [n /n] [] []	[]	[и]						
RECOMMENDAT	cions:	(If d	ifferent	from NAS	SA)							
[3 /3] [NA] [NA]	[NA]	[D] OD/DELETE)						
* CIL RETEN	NTION	RATIONAL	E: (If ap	plicable	e) ADEQUATE INADEQUATE	[]						
REMARKS: FAILURE TO UNLOCK IS ADDRESSED ON 0454-3. FAILURE OF THE INDICATOR HAS NO EFFECT. REF: RI/NASA CIL OF 12-23-87 AND RI/NASA CIL WORKSHEET OF 12-15-87.												

ASSESSME ASSESSME NASA FME	ENT ID:	: 1/21/88 MPS-215 0454-7		NASA DATA: BASELINE [] NEW [X]								
SUBSYSTE MDAC ID: ITEM: ONLY)		MPS 215 LO2 AND	LH2 FE	ED DISCO	NNECT LATCH	ASSEMBLY (ORB						
LEAD ANA	LYST:	W.J. MC	NICOLL									
ASSESSME	ENT:											
	CRITICA:	HT	REDUNDA	ANCY SCR	EENS	CIL ITEM						
	HDW/F	JNC	A	В	С							
NASA IOA	[1 /1 [1 /1] [NA] NA]	[NA] [NA]	[NA] [NA]	[X] *						
COMPARE	[/] []	[]	[]	[N]						
RECOMMEN	DATIONS	(If d	ifferent	from N	ASA)							
	[/] [1	[]		[] (ADD/DELETE)						
	TENTION	RATIONAL	E: (If a	pplicab	le) ADEQUATE INADEQUATE							
REMARKS: REF: RI 87.	/NASA CI	L OF 12-	23-87 AN	D RI/NAS	SA CIL WORKS	HEET OF 12-15-						

ASSESSMEI ASSESSMEI NASA FME	NT I			IPS-216X						NASA DATA: BASELINE [] NEW [X]							
SUBSYSTEMDAC ID: ITEM: ONLY)	M:		MPS 216 LO2 A	ND	LH	[2 I	FEED	DIS	CONN	ECT	r L	АТСН	AS	SE	MB	LY	(ORB
LEAD ANA	LYST	:	W.J.	MCN	IIC	OLI	L										
ASSESSME	NT:																
CRITICALITY REDUNDANCY						Y S	CREE	NS				CI		ī			
FLIGHT HDW/FUNC					A B					С							
NASA IOA	[2 [2	/1R /1R]	[P P]	[[NA] NA]		[]	P] P]			[[X]	*
COMPARE	ſ	/]	[]	[]		נ]			[N]	
RECOMMEN	DATI	ons:	(If	d :	if:	fer	ent i	ron	n NAS	A)							
	[/]	[]	[]		[]		(AI	[DD/	'DE] ELE	TE)
* CIL RE	TENT	ON	RATION	AL	Е:	(I	f app	plic	able			EQUA?		[]	
REMARKS: REF: RI 87.	/NAS	A CI	L OF 1	.2-	23	-87	AND	RI/	/NASA	C	IL	WOR	кѕні	EET	ר כ	OF	12-15-

ASSESSMI ASSESSMI NASA FMI	ENT ENT EA #	DATE: ID: :	1/21 MPS- 0805	/88 217X - 1			NASA DATA: BASELINE [] NEW [X]								
SUBSYSTIMDAC ID ITEM: ONLY)			217	AND 1	LH2 F	FEED D	ISCO	NNECT	LATCH	ASSEM	BLY	(ORB			
LEAD AN	ALYS'	T:	W.J.	MCN	COLI	<u>.</u>									
ASSESSMI	ENT:														
		TICAL FLIGH		I	REDUN	IDANCY	SCR	EENS		CII					
		DW/FU		7	A	В		c	2	ITE	M				
NASA IOA	[/1R /]	[[]	[]]]	(X] *				
COMPARE	[/N]	[]	[]	[]	[N]				
RECOMMEN	NDAT:	ions:	(I	f dif	fere	nt fr	om N	ASA)							
	[/]	[]	[J	[]	D] ADD/D		E)			
* CIL RI	ETENT	rion 1	RATIO	NALE:	(If	appl	icab	A	DEQUATE]				
REMARKS: THIS FAI INDICATI OF 12-23	LURI	OR 04	JLD B 154-6	E COV , ERR	ERED CONEO	UNDEI US INI	R 04	54 - 5.	LOSS O	F POS	ITIO ASA	N CIL			

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	1/22/88 MPS-218X 0303-2		NASA DATA: BASELINE [] NEW [X]						
SUBSYSTEM: MDAC ID: ITEM:	MPS 218 LO2 FILL	18 D2 FILL AND DRAIN DISCONNECT (PD12)							
LEAD ANALYST:	W.J. MCN	ICOLL							
ASSESSMENT:									
CRITICAL		REDUNDANC	Y SCREEN	5	CIL ITEM				
FLIGH HDW/FU		A	В	С					
NASA [1 /1 IOA [1 /1] [NA] [:	NA] [NA] [NA] NA]	[X] *				
COMPARE [/] [] [] []	[и]				
RECOMMENDATIONS:	(If di	fferent f	rom NASA)					
[/] [] [] [] (Al	[] DD/DELETE)				
* CIL RETENTION	RATIONALE	E: (If app		ADEQUATE					
REMARKS: REF: RI/NASA CI 87.	L OF 12-2	23-87 AND	RI/NASA	CIL WORKSH	EET OF 12-14-				

ASSESSMI ASSESSMI NASA FMI		1/22/88 MPS-219X 0303-3		NASA DATA: BASELINE [] NEW [X]							
SUBSYSTE MDAC ID:		MPS 219 LO2 FILL	AND DR	AIN DISC	CONNECT (PD1	2)					
LEAD ANA	LYST:	W.J. MCN	ICOLL								
ASSESSME	ENT:										
	CRITICAL FLIGH HDW/FU	r	REDUNDA A	NCY SCRE	CENS	CIL ITEM					
NASA IOA	[3 /3 [3 /3] [1	NA] NA]	[NA] [NA]	[NA] [NA]	[] *					
COMPARE	[/] [1	[]	[]	[]					
RECOMMEN	DATIONS:	(If dif	ferent	from NA	SA)						
	[/] []	[]	[]	[] ADD/DELETE)					
REMARKS:		RATIONALE:			ADEQUATE INADEQUATE	į					
REF: RI	/NASA FMI	SA/CIL REV	TEW ME	ETING NO	TES (J.E. BO	RCHES).					

ASSESSMEI ASSESSMEI NASA FME	NT I	D:	MPS-	L/22/88 NASA DATA: MPS-220X BASELINE [] 0303-4 NEW [X]											
SUBSYSTEMDAC ID:	M:		MPS 220 LO2	FILL	AND	DRAIN	DIS	CONNE	CT (P	D12)					
LEAD ANA	Lyst	':	W.J.	MCN	ICOLL										
ASSESSME	NT:														
			YTI		REDUN	DANCY	SCR	EENS	S CIL ITEM						
	HD	LIGH W/FU	NC		A	В									
NASA IOA	[3	3 /3]]	NA] NA]	[N	A] A]	[]	NA] NA]		[]	*		
COMPARE		/		[]]	[]		[}			
RECOMMEN	IDAT]	IONS:	: (If d	iffere	ent fi	om N	IASA)							
	[/]	τ	3	[]	[)	(A	[DD/I) DELE	TE)		
* CIL RI	ETEN'	TION	RATI	ONAL	E: (I1	f app	licak		ADEQUA ADEQUA]			
REMARKS REF: R	: I/NA	SA F	MEA/C	IL R	EVIEW	MEET	ing 1	OTES	(J.E	. во	RCH!	ES).	,		

ASSESSM ASSESSM NASA FM	ENT]	D:	1/22 MPS- 0303	-221X		NASA DATA: BASELINE [] NEW [X]							
SUBSYSTIMDAC ID:			MPS 221 LO2	FILL	AND	DRA:	IN DI	SCONN	NECT (PD12	·)	-	
LEAD AND	LYSI	!:	W.J.	MCN	ICOL	L							
ASSESSME	ENT:												
	F	ICAI LIGH W/FU			REDU A	NDAN	CY SCI		c		CI:	_	
NASA IOA	[3 [3	/3 /3]	[]	NA] NA]]	NA] NA]]	NA] NA]		[]	*
COMPARE	[/]	[]	[]	[]		[3	
RECOMMEN	DATI	ons:	(I	f dif	fer	ent f	rom N	IASA)					
	[/]	Į.]	[]	[]	(AI	[DD/E] ELE:	re;
* CIL RE	TENT:	ION	RATIO	VALE:	(Ii	f app	licab		ADEQU <i>I</i> ADEQU <i>I</i>		[]	
	/NAS	A FM	EA/CII	L REV	IEW	MEET	ING N	OTES	(J.E.	BOF	СНЕ	s).	

ASSESSME	SSESSMENT DATE: 1/25/88 NASA DATA SSESSMENT ID: MPS-222X BASELINE ASA FMEA #: 0401-6 NEW										[_		
SUBSYSTE MDAC ID:				MPS 222 LO3		/ALVE	(PV1	., 2,	3)					
LEAD ANA	LYS	T:		W.3	J. MCN	ICOL	L							
ASSESSME	NT:	;												
	CRI		CAI			REDUI	NDANC	Y SCF	REENS	3		CII		
	F	IDW	/FT	JNC		A		В		С				
NASA IOA	[[3 3	/3 /3]	[NA] NA]	[NA] NA]] [NA] NA]		[]	*
COMPARE	[/]	[]	[]	[]		[3	
RECOMMEN	[AD	ric	ons	:	(If d	iffer	ent i	from 1	IASA)					
	[/]	[]	[]	[)		[DD/I		ETE)
* CIL RE	TE	N T]	CON	RAT	IONAL	E: (I	f app	olical		ADEQUA NADEQUA	ATE ATE	[]	
REMARKS:	: [/ N]	ASZ	A F	MEA/	CIL R	EVIEW	MEE:	ring i	OTES	5 (J.E	. во	RCHI	ES).	•

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	MPS-223X	PS-223X BASELINE []												
MDAC ID:	MPS 223 LO2 PREVALVE (P	V1, 2, 3)												
LEAD ANALYST:	W.J. MCNICOLL													
ASSESSMENT:	ASSESSMENT:													
CRITICALITY REDUNDANCY SCREENS CIL ITEM														
HDW/FU	NC A	В	С											
NASA [1 /1 IOA [1 /1] [NA]] [NA]	[NA] [[NA] [NA] NA]	[X] * []										
COMPARE [/] []	[]	1	[и]										
RECOMMENDATIONS:	(If different	from NASA)											
[/] []			[] DD/DELETE)										
* CIL RETENTION RATIONALE: (If applicable) ADEQUATE []														
INADEQUATE [] REMARKS: REF: RI/NASA CIL OF 12-23-87 AND RI/NASA CIL WORKSHEET OF 12-15-														

ASSESSME ASSESSME NASA FME	MEA #: 0801-1 NEW]				
SUBSYSTE MDAC ID:			MPS 224 LO2 PF	REVAI	VE (P	V1,	2, 3)									
LEAD ANA	LYST	:	W.J. N	ICNIC	COLL											
ASSESSMI	ent:															
CRITICALITY REDUNDANCY SCREENS FLIGHT											L EM	Į.				
	_	W/FU		A	в с] [] []] [] []											
NASA IOA		/1R /]	[]	[]	[]		[[X]	*			
COMPARE	C	/N]	[]	[]	[]	[N]				
RECOMME	NDATI	ONS:	(If	dif	feren	t fro	om NA	SA)								
	ſ	/]	ι]	[]	ξ] (2		D /D		ETE)			
* CIL R	* CIL RETENTION RATIONALE: (If applicable) ADEQUATE [] INADEQUATE []															
THIS FA	REMARKS: THIS FAILURE MODE SHOULD BE ADEQUATLEY ADDRESSED UNDER ERRONEOUS INDICATION (0401-6).															

ASSESSM ASSESSM NASA FM	ENT	Ι	D:	MPS	MPS-225X BASELI 0414-4 P								LINE	TA: NE [] EW [X]				
SUBSYST: MDAC ID ITEM:				MPS 225 LO2	FEE	DLI	NE	REL	IE:	F £	SHUTO	FF	VAI	VE ((PV	7)		
LEAD AN	ALY	ST	:	W.J	. MC	NIC	OLL	1										
ASSESSMI	ENT	:																
CRITICALITY REDUNDANCY SCREENS CIL FLIGHT ITEM HDW/FUNC A B C																		
]	HD	W/FU	NC	A B C										IIEM			
NASA IOA]	2	/1R /3]	[[P NA]	[F N#]]	P N2] A]		[x]	*
COMPARE	[N	/N]	[N]	[N]	[N	J		[N]	
RECOMMEN	IDA'	ľI	ONS:	(I	f di	iff	ere	nt :	fro	m	NASA)						
	[3	/3]	[NA]	[NA	.]	[NA	A]	(A	[DD/	D DE		ΓE)
* CIL RE	TEN	T	ON F	OITAS	NALE	E:	(If	apr	oli	ca	ble)							
REMARKS:											II		EQU2	ATE ATE	[]]	
FAILURE FAILURE REF: RI	Ur	1.1	1E IV	IDICA	T.TOM	S	YSTF	?M C	INC	v	IS AI WILL ASA (HA	37E 3	IO EI	0.00			

ASSESSMEI ASSESSMEI NASA FME	ТV	ID	:	MPS	PS-226X BASELINE [] 414-5 NEW [X]									
SUBSYSTEM MDAC ID:	M:			MPS 226 LO2		DLINI	E REL	IEF :	SHUTOI	FF VAI	VE (I	? V 7)		
LEAD ANA	LYS	T:		W.J	. MCN	ICO1	LL							
ASSESSME	NT:													
	CRITICALITY REDU FLIGHT HDW/FUNC A								CREENS			CII		
	Н	DW	/FU			A		В		С				
NASA IOA	[[3	/3 /3]	[NA]	[NA] NA]]	NA]		[]	*
COMPARE	[/]	[]	[]	[]		[]	
RECOMMEN	DAT	OI	NS:	((If d	iffe	rent	from	NASA)				
	[/]	[]	[]	ſ]	(A	-) DELE	ETE)
* CIL RE		TI	ON	RAT	ONAL	E: (If ap	plic		ADEQ NADEQ	UATE UATE	[]	
REMARKS:	/N2	ASA	FM	EA/C	CIL R	EVIE	W MEE	TING	NOTE	s.				

ASSESSM ASSESSM NASA FM	ENT	ID:		5/88 -227X 4-6				NASA DATA: BASELINE [] NEW [X]						
SUBSYST: MDAC ID ITEM:			MPS 227 LO2	FEEDI	LINE	REL:	IEF SH	UTOF	F VAI	VE (PV7)		
LEAD AN	ALYS	T:	W.J	. MCNI	COLI									
ASSESSMI	ENT:													
DI TAMP											CII			
		•					Б		C					
NASA IOA	[3 /3 3 /3]	[N [N	IA] IA]	[[NA] NA]	[]	NA] NA]		[]	*	
COMPARE	[/]	ĺ]	[]	[]		[]		
RECOMMEN	TADI	ions:	(1	f dif	fere	nt f	rom N	ASA)						
	[/]	[]	[]	[]	(A	[D D /E] ELE	TE	
* CIL REREMARKS:	;						olicab CING N	INZ	ADEQU ADEQU		[]		
		on I'm		L KEV	TCW	ncc I	THE M	OIES.	•					

ASSESSMENT DATE:	1/25/88		NASA DATA:							
ASSESSMENT ID:		X		BASELINE						
NASA FMEA #:				NEW	[X]					
111111111111111111111111111111111111111	 -									
SUBSYSTEM:	MPS									
	228									
MDAC ID.	702 OUT	DONDO PTT	T. AND DRA	IN VALVE (PV91					
ITEM:	102 001	DOARD III	L MID DIG		,					
LEAD ANALYST:	W.J. MC	NICOLL								
ASSESSMENT:										
CRITICAL	ፐጥሃ	REDUNDAN	CY SCREEN	is	CIL					
FLIGH					ITEM					
HDW/FU	_	A	В	С						
11511/10			_							
MACA [2 /1P	1 (ו פ	ו וד	Pl	[X] *					
NASA [2 /1R IOA [3 /3	j i	ו מע	ו מא	NAI	[X]* []					
TOA [3 / 3	j L	na (,						
COMPARE [N /N	1 [N] [N] [[и]	[N]					
COMPARE [N /N	j L	2 , 1	,							
RECOMMENDATIONS:	(Tf d	ifferent	from NASA	4)						
RECOMMENDATIONS.	(11 4			-,						
[3 /3	1 r	ו ובע	NA]	NA1	[D]					
[3 / 3	j L	***** [,	(A	DD/DELETE)					
				\	,,					
. CTT DOMENIMICAL	DAMTONAT	P. (Tf ar	nlicable	1						
* CIL RETENTION	RATIONAL	E. (II al	pricable	ADEQUATE	[]					
				INADEQUATE						
			-	INADECONIE	L J					
REMARKS:					N 0211 4					
FAILURE OF THE V	ALVE TO	REMAIN C	LOSED IS A	ADDRESSED O	N U311-4.					
FAILURE OF THE P	OSITION	INDICATOR	R ALONE W	ILL HAVE NO	EFFECT.					
REF: RI/NASA CI	L OF 12-	23-87 ANI	RI/NASA	CIL WORKSH	EET OF 12-10					
87.										

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	MPS-229X		NASA DATA: BASELINE [] NEW [X]							
MDAC ID:	MPS 229 LO2 OUTBO	ARD FILL ANI	D DRAIN VALVE	(PV9)						
LEAD ANALYST:	W.J. MCNI	COLL								
ASSESSMENT:										
CRITICALITY REDUNDANCY SCREENS CIL FLIGHT ITEM										
HDW/FU	NC A	В	С							
NASA [2 /1R IOA [2 /1R] [P] [F]] [F]	[P] [P]	[X] *						
COMPARE [/] [] []	[]	[N]						
RECOMMENDATIONS:	(If dif	ferent from	NASA)							
[/] [] []	[]	[] ADD/DELETE)						
* CIL RETENTION I	RATIONALE:	(If applica	ble) ADEQUATE INADEQUATE	ĹĴ						
REMARKS: REF: RI/NASA CII 87.	L OF 12-23	-87 AND RI/N	ASA CIL WORKSH	•						

ASSESSMEN ASSESSMEN NASA FMEN	T	ID:	:	MPS	PS-230X											
SUBSYSTEM MDAC ID:	И:			MPS 230 LO2		ВС	AR	D F	ILI		AND	DRAI	N VALV	Œ (PV9)
LEAD ANA	LYS	T:		W.J	. MC	N]	CCC	LL								
ASSESSME	NT:															
CRITICALITY REDU FLIGHT							DUND	ANG	CY	SCF	REENS	3	CIL ITEM			
	H	_	/FU	NC		_	A			F	-		С			
NASA IOA	[3	/3 /3]	[: 1	NA NA]]	[ì	NA] NA]	[[NA] NA]		[] *
COMPARE	[/]	1	[]	[3	[]		[]
RECOMMEN	IDA'.	rio	ns:		(If o	li	ff	eren	ıt	f	rom 1	nasa))			
	[/]		[]	[]	[]	(2] ADD/] DELETE)
* CIL RI	TE!	NTI	ON	RAT	IONĀ	LΕ	:	(If	ap	p	lica		ADEQU NADEQU]
REMARKS:	: [/N	AS?	A FI	ſEA/	CIL	RE	VI	EW 1	MEE	T	ING	NOTE	s.			

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	MPS-231X		NASA DATA: BASELINE [] NEW [X]									
MDAC ID:	MPS 231 LO2 OUTBOA	ARD FILL AND D	RAIN VALVE (1	P V 9)								
LEAD ANALYST:	W.J. MCNIC	OLL										
ASSESSMENT:												
CRITICALI FLIGHT	•	DUNDANCY SCREE	ens	CIL ITEM								
HDW/FUN	IC A	В	С	TIEM								
NASA [2 /1R IOA [2 /1R] [P] [P] [P]	[P] [P]	[X] *								
COMPARE [/] [] []	[]	[N]								
RECOMMENDATIONS:	(If diffe	erent from NAS	A)									
1) [:] []	[] (AD	[] D/DELETE)								
* CIL RETENTION R	ATIONALE:	(If applicable)									
REMARKS:			ADEQUATE INADEQUATE	• •								
REF: RI/NASA CIL 87.	OF 12-23-8	37 AND RI/NASA	CIL WORKSHE	ET OF 12-10-								

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	MPS-232X	MPS-232X BASELINE									
MDAC ID:	MPS 232 LO2 INBO	ARD FILI	AND DRA	IN VALVE (P	V10)						
LEAD ANALYST:	W.J. MCN	ICOLL									
ASSESSMENT:											
CRITICALITY REDUNDANCY SCREENS CIL FLIGHT ITEM HDW/FUNC A B C											
HDW/FU	С										
NASA [1 /1 IOA [3 /3] [NA] [NA] [NA]	[NA] [NA]	[X] *						
COMPARE [N /N] [] []	[]	[и]						
RECOMMENDATIONS:	(If di	fferent	from NAS	SA)							
[3 /3] [NA]	[NA]	[NA]	[D] DD/DELETE)						
* CIL RETENTION	RATIONALE	: (If a	pplicable	e) ADEQUATE INADEQUATE							
REMARKS: FAILURE OF THE V FAILURE OF THE P REF: RI/NASA CI 87.	OSTTION I	NDICATO	R ALONE V	ADDRESSED O	N 0310-4. EFFECT.						

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	MPS-233X		1	NASA DATA BASELINE NEW						
	MPS 233 LO2 INBOA	33 D2 INBOARD FILL AND DRAIN VALVE (1								
LEAD ANALYST:	W.J. MCNI	COLL								
ASSESSMENT:										
CRITICAI FLIGH HDW/FU	T	EDUNDANCY B		3	CIL ITEM					
NASA [1 /1 IOA [1 /1] [N.	A] [NA A] [NA	A] [1 A] [1	NA] NA]	[X] *					
COMPARE [/] [] [] [J	[N]					
RECOMMENDATIONS:	(If dif	ferent fro	om NASA)							
[/	J [] [) ([] DD/DELETE)					
* CIL RETENTION REMARKS:			INA	ADEQUATE ADEQUATE						
REF: RI/NASA CI	L OF 12-23	-87 AND R	I/NASA CI	L WORKSHE	ET OF 12-9-					

ASSESSME ASSESSME NASA FME	NT II):	MPS-	-234X]	NASA DATA: BASELINE [] NEW [X]					
SUBSYSTE MDAC ID:			MPS 234 LO2	INBOA	RD F	ILL	AND D	RAIN	VALVE	(P)	/10)			
LEAD ANA	LYST	:	W.J	. MCNI	COLL									
ASSESSME	ENT:													
CRITICALITY REDUNDANCY SCREENS CIL FLIGHT ITEM HDW/FUNC A B C														
NASA IOA	[1 [1	/1 /1]	[N	[A] [A]	[NA] NA]	[[NA] NA]		Х]]]	*	
COMPARE	(/]	[]	[)	[]		[]]		
RECOMMEN	ITADI	ons:	(If dif	fere	nt :	from N	IASA)						
	[/]	[]	(3	[]	(A	[DD/[ETE)	
* CIL R	ETENT	ION	RATI	ONALE:	(If	ap	plical		ADEQU <i>I</i> IADEQU <i>I</i>	TE TE	[]		
REMARKS REF: R: 87.	: I/NAS	A CI	L OF	12-23	8-87	AND	RI/NA	ASA C	CIL WOR	RKSH	EET	OF	12-9-	

ASSESSME ASSESSME NASA FME	NT :	ID:	MPS-	235X			NASA DATA: BASELINE [] NEW [X]							
SUBSYSTE MDAC ID: ITEM:			MPS 235 LO2	INBO	ARD F	ILL A	AND E	RAIN	VALVI	E (P	V10])		
LEAD ANA	LYS	r:	W.J.	MCN	COLI									
ASSESSME	NT:													
	DANC)	scr	REENS	2		CII								
NASA IOA	[3	3 /3]	1] 1]	NA] NA]	1] 1]	IA] IA]	[N	IA] IA]		[] *		
COMPARE	[/]	[]	ĺ]	[]		[]		
RECOMMEN	DAT]	ons:	(I	f dif	fere	nt fr	om N	ASA)						
	[/]	[]	[]	[]		[DD/E] ELETE)	
* CIL RE' REMARKS: REF: RI			RATION					INA	DEQUA	TE TE	[]		

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	1/25/88 MPS-236X 0310-11	S-236X 10-11 NEW [X							
SUBSYSTEM: MDAC ID: ITEM:	MPS 236 LO2 INBOAL	RD FILL A	ND DRAI	N VALVE (P	710)				
LEAD ANALYST:	W.J. MCNI	COLL							
ASSESSMENT:									
CRITICAL		EDUNDANCY	SCREEN	is .	CIL ITEM				
FLIGH HDW/FU	_	P	3	С					
NASA [1 /1 IOA [1 /1] [N.	A] [N A] [N	IA] [AI	NA] NA]	[X] *				
COMPARE [/] [] [] (]	[N]				
RECOMMENDATIONS	: (If dif	ferent fi	com NASI	A)					
[/] [] [1	[] (A)	[] ADD/DELETE)				
* CIL RETENTION	RATIONALE:	(If app) ADEQUATE INADEQUATE					
REMARKS: REF: RI/NASA C 87.	IL OF 12-23	3-87 AND	RI/NASA	CIL WORKS	HEET OF 12-9-				

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	MPS-237X		NASA DATA: BASELINE [] NEW [X]								
MDAC ID:	MPS 237 LO2 INBO	ARD FIL	L AND DE	AIN VAL	Æ (PV	10)					
LEAD ANALYST:	W.J. MCN	COLL									
ASSESSMENT:											
CRITICAL: FLIGHT	ITY F	REDUNDA	NCY SCRE	ENS		CIL					
	IC A	\	В	С	•	ITEM					
NASA [/1R IOA [/] []	[]	[]		[X] *					
COMPARE [/N			[]	[]	ĺ	[и]					
RECOMMENDATIONS:	(If dif	ferent	from NA	SA)							
			.]			D] DELETE	E)				
* CIL RETENTION R	ATIONALE:	(If ap	plicable								
REMARKS:				ADEQUA INADEQUA	ATE []]					
THIS FAILURE MODE INDICATION (0310- REF: RI/NASA CIL	91 AUU 147	ש אנו היכ	ATELY AD	DRESSED INDICATI	UNDER	ERRONE	OUS				

ASSESSMENT ASSESSMENT NASA FMEA	ID:	:	1/2 MPS 045	-238X			NASA DATA: BASELINE [] NEW [X]							
SUBSYSTEM: MDAC ID: ITEM:			MPS 238 LO2		D SHU	TOFF	VALV	E (PV	719)					
LEAD ANALY	ST:		W.J	. MCN	ICOLI									
ASSESSMENT	!:													
CR		CAL:			REDUI	NDANC'	y scr	EENS			CIL			
	HDW,		NC		A	-	В	C						
NASA [IOA [3	/3 /3]	[[NA] NA]	[] []	NA] NA]	[]	NA] NA]		[] *		
COMPARE [/]	[1	[]	[3		[]		
RECOMMENDA	TIO	ns:	((If di	iffer	ent f	rom N	ASA)						
1		/]	C]	ſ]	(]		[DD/D] ELETE)		
* CIL RETI	ENTI	ON	RATI	ONALI	E: (I	f app	licab	i	ADEQU ADEQU		[]		
REMARKS: REF: RI/I	NASA	FM	EA/C	CIL R	EVIEW	MEET	ING N	OTES						

ASSESSMENT NASA FMEA	r ID:		K		NASA DATA: BASELINE [] NEW [X]							
SUBSYSTEM: MDAC ID: ITEM:		MPS 239 LO2 BLEE	ED SHUTOF	(PV19)								
LEAD ANALY	YST:	W.J. MCN	NICOLL									
ASSESSMENT	r:											
CI	RITICALI FLIGHT		REDUNDAN	CY SCRE	ens	CIL ITEM						
	HDW/FUN		A	В	С	IIEM						
NASA (1 /1] [NA] [NA] [NA] NA]	[NA] [NA]	[X] *						
COMPARE [. /] [] []	[]	[N]						
RECOMMENDA	ATIONS:	(If di	fferent :	from NAS	SA)							
[. /] [] []	[] (A	[] DD/DELETE)						
* CIL RETE	ENTION F	RATIONALE	: (If app	olicable	e) ADEQUATE INADEQUATE							
REMARKS: REF: RI/N 87.	ASA CIL	OF 12-2	3-87 AND	RI/NASA	CIL WORKSHI	EET OF 11-13-						

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	MPS-240X	ì	NASA DATA: BASELINE [] NEW [X]										
MDAC ID:	MPS 240 LO2 POGO AC	CCUMULATOR RECIR	C VALVE (PV20, 21)										
LEAD ANALYST:	W.J. MCNICO	OLL											
ASSESSMENT:													
CRITICALITY REDUNDANCY SCREENS CIL FLIGHT ITEM													
HDW/FU		В	C										
NASA [2 /1R IOA [3 /3] [P]] [NA]] [F] []] [NA] []	P] [X] * NA] []										
COMPARE [N /N] [N]] [N] [¹	и] [и]										
RECOMMENDATIONS:	(If diffe	erent from NASA)											
[3 /3] [NA] [AN] [NA] [D] (ADD/DELETE)										
* CIL RETENTION	RATIONALE:		ADEQUATE [] ADEQUATE []										
REMARKS: FAILURE TO REMAIN OPEN IS ADDRESSED ON 0453-1. FAILURE OF THE INDICATOR ALONE WILL HAVE NO EFFECT. REF: RI/NASA OF 12-23-87 AND RI/NASA CIL WORKSHEET OF 10-17-87.													

ASSESSME ASSESSME NASA FME	:NT	I	D:		-241			NASA DATA: BASELINE [] NEW [X]							
SUBSYSTE MDAC ID:				MPS 241 LO2) ACC	MULA	TOR	RECII	RC VAL	VE (PV2	0, 2	1)	
LEAD ANA	LYS	ST	:	W.J	. MCI	VICOLI	<u>.</u>		•						
ASSESSME	NT:	:													
		Fl	LIGH			REDUN	IDANC	EY SC	REENS	c c		CI			
NASA IOA	[3	/3 /3]]	NA] NA]]	NA] NA]]	NA] NA]		[]	*	
COMPARE	[/]	[]	[]	[]		[]		
RECOMMEN	DAT	CIC	ns:	(If di	ffere	ent f	rom 1	NASA)						
	[/]	[]	[]	[)	(A	[.DD/I] DELE:	re)	
* CIL RE									IN	ADEQU.		[]		
REF: RT	/N2	SA	M'H	ፑል / ሮ	TT. DE	WTTV!	MEDO	TMC 1	TOMEC	,					

ASSESSMENT DATE ASSESSMENT ID: NASA FMEA #:	1/26/88 MPS-243 0427-2	PS-243X NEW [X] 427-2 NEW [X]							
SUBSYSTEM: MDAC ID: ITEM:	MPS 243 LH2/LO2	PROPELI	ANT LEVEL	SENSORS					
LEAD ANALYST:	W.J. MC	NICOLL							
ASSESSMENT:									
CRITICA		REDUNDA	ANCY SCREE	INS	CIL ITEM				
FLIC HDW/I		A	В	С					
NASA [2 /: IOA [3 /:	.R] .R]	[P] [P]	[F] [F]	[P] [P]	[X] * []				
COMPARE [N /	1	[]	[]	[]	[N]				
RECOMMENDATION	s: (If	differen	t from NA	SA)					
[3 /	ır]	[P]	[F]	[P]	[] ADD/DELETE)				
* CIL RETENTIO	N RATIONA	LE: (If	applicabl	e) ADEQUATE INADEQUATE	[]				
REMARKS: THIS ASSESSMEN PROVIDE REDUNI REF: RI/NASA	T ALSO CO ANCY TO I CIL OF 12	KEARMT .	2 SENSORS. JNDERFILL.	MULTIPLE	SENSORS				

NASA FI	MEN] MEA								NASA DATA: BASELINE [] NEW [X]									
SUBSYST		3		MPS														
MDAC II ITEM:) :			244 LH2/I	.O2	P	ROPE	LLA	NT	LE	VEL	SE	NSOR	S				
LEAD AN	IALY	ST	:	W.J.	MC	NI	COLL											
ASSESSM	ENT	:																
	CR		ICAL LIGH	ITY T		R	EDUNI	OAN	CY	SCI	REEN	s			C:	IL		
	HDW/FUN								В с						ITEM			
NASA	[3	/1R]	[P]	Г	F	1	г	Ŧ	1		•	7,		
TOA	[3	/1R]	[P P	j	į	F	j	[P]		ſ	Х	j	*
COMPARE	[/]	[]	[]	ι	N	3		ι	N]	
RECOMME	'ADA	ric	ons:	(If	di	Ĺff	eren	t £	rc	om N	'ASA)	ı						
			/]	[]]	(AD	[D/	DE] LE	TE)
* CIL RI	TEN	TI	ON R	ATIONA	LE	:	(If a	app	li	.cab	le)				•			-,
REMARKS:											IN	AD AD	EQUA'	re re	[[]	
THIS ASS PROVIDE REF: RI	VED	NU	DANC	LSO CO Y TO P OF 12	RE	VE	ያስ ጥለ	SEI /ERI	NS FI	ORS.	. м	UL	TIPL	E SE	1 S0)R	S	

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	MPS-247X			NASA DATA: BASELINE NEW			
MDAC ID:	MPS 247 LH2 DELTA	-P TRANSI	OUCER (MI	244)			
LEAD ANALYST:	W.J. MCNI	COLL					
ASSESSMENT:							
CRITICAL FLIGH		REDUNDANCY	SCREENS	5	CIL ITEM		
HDW/FU		. F	3	С			
NASA [1 /1 IOA [1 /1] [N	IA] [1 IA] [1	IA] [IA] [NA] NA]	[X] * []		
COMPARE [/] [] [] []	[и]		
RECOMMENDATIONS:	(If dif	fferent fi	com NASA)	l			
[/] [] [] [) (Al	[] DD/DELETE)		
* CIL RETENTION RATIONALE: (If applicable) ADEQUATE [] INADEQUATE []							
REMARKS: REF: RI/NASA CIL OF 12-23-87 AND RI/NASA FMEA/CIL REVIEW MEETING NOTES.							

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	1/26/88 MPS-248X 0420-1	NASA BASE	DATA: LINE [] NEW [X]
MDAC ID:	MPS 248 LO2 12 INCH FER	EDLINE (FH 3, 4,	5)
LEAD ANALYST:	W.J. MCNICOLL		
ASSESSMENT:			
CRITICALI FLIGHT HDW/FUN	?	ANCY SCREENS B C	CIL ITEM
NASA [3 /3 IOA [3 /3] [NA]] [NA]	[NA] [NA] [NA]	[] *
COMPARE [/] []	[] []	[]
RECOMMENDATIONS:	(If different	from NASA)	
()] []	[] []	[] (ADD/DELETE)
* CIL RETENTION R REMARKS: REF: RI/NASA FME	ATIONALE: (If a	ADEQUA INADEQUA	

ASSESSMEN ASSESSMEN NASA FMEA	T ID:		MPS-2	49X				1	NASA I BASE1]	
SUBSYSTEM MDAC ID:	1:		MPS 249 LO2 1	.2 II	NCH FI	EEDL	INE (I	FH 3	, 4, !	5)			
LEAD ANA	LYST:		w.J.	MCN:	ICOLL								
ASSESSME	T:												
•		IGHI	?			DANC	Y SCRI	EENS	C		CIL		
	HDW,	/FUN	IC		A		В		_				
NASA IOA		/3 /3]	[[NA] NA]] [NA] NA]	[NA] NA]		[] *	t
COMPARE	[/)	[1	[]	[3		[]	
RECOMMEN	DATIO	NS:	(I	f di	ffere	nt :	from N	ASA))				
	[/	3	Ţ]	[3	[]	(A	[DD/D] ELE:	TE)
* CIL RE	TENTI	ON	RATIO	NALI	E: (If	ap	plicab		ADEQI VQEDAN]	
REMARKS: THIS AND FMEA/CII	LYSIS	IS EW	FOR MEETI	THE NG 1	FOAM	INS	ULATEI	LI	NE. I	REF:	RI/	/NAS	A

	1/26/88 MPS-250X 0609-2		NASA DATA BASELINE NEW	•
SUBSYSTEM: MDAC ID: ITEM:	MPS 250 GO2 PRESSURE	MANIFOLD REP	RESS ORIFI	CE (RP1)
LEAD ANALYST:	W.J. MCNICOLI	i .		
ASSESSMENT:				
CRITICAL: FLIGHT	ITY REDUN	DANCY SCREENS	3	CIL
HDW/FU	NC A	В	С	ITEM
NASA [1 /1 IOA [1 /1] [NA]] [NA]	[NA] [[NA]	NA] NA]	[X] *
COMPARE [/] []	[] []	[N]
RECOMMENDATIONS:	(If differe	nt from NASA)		
[/] []	[] [-	[] DD/DELETE)
* CIL RETENTION R	ATIONALE: (If		ADEQUATE ADEQUATE	[]
	OF 12-23-87	AND RI/NASA F	MEA/CIL RE	VIEW MEETING

ASSESSME ASSESSME NASA FME	NT ID:	MPS-25	PS-251X BASELINE []							
SUBSYSTE MDAC ID: ITEM:		MPS 251 LO2 BL	EED LINE	, 1.5" DI	A					
LEAD ANA	LYST:	W.J. M	.J. MCNICOLL							
ASSESSME	ENT:									
	CRITICA		REDUND	ANCY SCRE	ENS	CIL ITEM				
	FLIG HDW/F		A	В	С					
NASA IOA	[1 /1 [1 /1]	[NA] [NA]	[NA] [NA]	[NA] [NA]	[X] * []				
COMPARE	[/	1	[]	[]	[]	[N]				
RECOMME	NDATIONS	: (If	differer	nt from NA	ASA)					
	[/]	[]	[]		[] ADD/DELETE)				
* CIL R	ETENTION	RATION	ALE: (If	applicab	le) ADEQUATE INADEQUATE	[]				
REMARKS REF: R NOTES.	: I/NASA (IL OF 1	2-23-87	AND RI/NA	SA FMEA/CIL	REVIEW MEETING				

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	1/26/88 MPS-252X 0424-1		NASA DATA BASELINE NEW	
MDAC ID:	MPS 252 LO2 RELIEF LIN	E (PV7 TO	RV5)	
LEAD ANALYST:	W.J. MCNICOLL			
ASSESSMENT:				
CRITICALI FLIGHT HDW/FUN	יי	ANCY SCREE	ns C	CIL ITEM
NASA [1 /1 IOA [1 /1] [NA]] [NA]	[NA] [NA]	[NA] [NA]	[X] *
COMPARE [/] []	[]	[]	[N]
RECOMMENDATIONS:	(If differen	t from NAS	A)	
[/] []	[]	[] (A D	[] DD/DELETE)
* CIL RETENTION R	ATIONALE: (If) ADEQUATE INADEQUATE	[]
REMARKS: REF: RI/NASA CIL 87.	OF 12-23-87 A		~	

ASSESSMI ASSESSMI NASA FMI	ENT I	D:	MPS-	253X					NASA D BASEL]	
SUBSYSTI MDAC ID: ITEM:			MPS 253 LO2	RELIE	F LI	NE,	1" DI	A (R	V5 TO	EXIT)		
LEAD ANA	ALYST	:	W.J.	MCNI	COLI	ı							
ASSESSMI	ENT:												
	F	LIGH	T			IDANC	CY SCR	EENS			CIL ITEN	1	
	HD	W/FU	NC	A	٠		В		С				
NASA IOA	[1 [1	/1]	[N [N	A] A]	[NA] NA]	[[NA] NA]		[X]	*
COMPARE	[/]	[]	[]	[]		[N]	
RECOMME	NDATI	ons:	(I	f dif	fere	ent i	from N	(ASA					
	[/]	[]	[]	[]	(AD	[D/D		TE)
* CIL RETENTION RATIONALE: (If applicable) ADEQUATE [] INADEQUATE []													
REMARKS REF: R: 87.		A CI	L OF	12-23	-87	AND	RI/NA	SA C	CIL WOR	RKSHE	ET (OF	8-23-

ASSESSMI ASSESSMI NASA FMI	ENT II):		254X					NASA D BASEL		-	•	
SUBSYSTI MDAC ID: ITEM:			MPS 254 LO2 F	ÆLI	EF SE	NSE	LINE,	.38	" DIA				
LEAD ANA	LYST:	:	w.J.	MCN	ICOLL	ı							
ASSESSME	ENT:												
	FI	LIGHT	ITY r 1C				Y SCR		C		CII		
NASA IOA]			[NA] NA]	[NA] NA]		к]]	;]]	*
COMPARE	[/]	[]	[]	[]		(N]	
RECOMMEN	IDATIC	NS:	(If	di	ffere	nt f	rom N	ASA)					
	[/	1	[]	[)	[]	(ADI	[D/E] ELE	ETE)
* CIL RE		ON F	RATION	ALE	: (If	app	licab	•	ADEQUA' ADEQUA'		[]	
REF: RI	/NASA	CII	L OF 1	.2-2	3-87	AND	RI/NA	SA C	IL WOR	KSHE	ΞT	OF	8-24-

ASSESSMEI ASSESSMEI NASA FME	ТN	II):	1/26 MPS- 0456	255}	ζ								SA DAT ASELIN NE				
SUBSYSTEM MDAC ID:	M:			MPS 255 LO2	RELI	Œ	SE1	NSE	LJ	NE,	• :	38	"	DIA				
LEAD ANA	LY	ST	:	w.J.	MC	NI(OLL											
ASSESSME	NT	:																
		F	ICAL: LIGH:	Г			EDUNI	DAN		SCR	EE	NS			CI:			
]	HDI	W/FUI	NC		A			В				С					
NASA IOA	[3	/ /1R]	[[P]	[F]		[[P]	[X] *]	
COMPARE	[N	/N	1	[N]	[N]		[N]	[N]	
RECOMMEN	'DA'	TI	ons:	(I	f d	if	fere	nt	fr	om N	IAS	A)						
	[3	/1R]	(P)	[F]		[P]	[D/] LETE)	
* CIL RE	TE	NT	ION :	RATIO	NAL	Е:	(If	ap	pl:	icab	ole			DEQUAT	[]	
REMARKS:															 			

FAILURE MAY PREVENT RELIEF VALVE FROM OPENING. REDUNDANCY EXISTS

TO RELIEVE MANIFOLD PRESSURE.

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	1/26/88 MPS-256X 0428-1	NASA DATA BASELINE NEW	
SUBSYSTEM: MDAC ID: ITEM: 1.5, 2" DIA	MPS 256 LO2 BLEED RECIRC	. & POGO SUPPRESSION	LINE, 1,
LEAD ANALYST:	W.J. MCNICOLL		
ASSESSMENT:			
CRITICALI FLIGHT		CY SCREENS	CIL ITEM
HDW/FUN	IC A	В С	11211
NASA [1 /1 IOA [1 /1] [NA] [] [NA] [NA] [NA] NA] [NA]	[X] *
COMPARE [/] [] [] []	[N]
RECOMMENDATIONS:	(If different	from NASA)	
[/] [] [[] DD/DELETE)
* CIL RETENTION F	NATIONALE: (If ap	ADEQUATE	[]
REMARKS: REF: RI/NASA CII 87.	. OF 12-23-87 AND	INADEQUATE RI/NASA CIL WORKSHI	

110010111111	1/26/88 MPS-2573 0428-2	¢ .	NASA DATA BASELINE NEW	
SUBSYSTEM: MDAC ID: ITEM: 1.5, 2" DIA	MPS 257 LO2 BLEI	ED RECIRC & PO	GO SUPPRESSION	LINE, 1,
LEAD ANALYST:	W.J. MC	NICOLL		
ASSESSMENT:				
CRITICAL FLIGH		REDUNDANCY SC	REENS	CIL ITEM
HDW/FU		A B	С	
NASA [1 /1 IOA [/] [NA] [NA]] []	[NA] []	(X) *
COMPARE [N /N] [и] [и]	[N]	[N]
RECOMMENDATIONS:	(If d	ifferent from	NASA)	
[/] [] []	[]	[D] ADD/DELETE)
* CIL RETENTION	RATIONAL	E: (If applica	able) ADEQUATE INADEQUATE	[]
REMARKS: FAILURE MODE IS	ADDRESSE	D ON 0428-1.	THIS FMEA/CIL	SHOULD BE

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:			NASA DATA BASELINE NEW	
	MPS 258 LO2 DELTA PRES	SSURE LINE,	.25" DIA	
LEAD ANALYST:	W.J. MCNICOLL			
ASSESSMENT:				
CRITICAL FLIGH HDW/FU		DANCY SCREEN B	rs C	CIL ITEM
NASA [1 /1 IOA [1 /1] [NA]] [NA]	[NA] [[NA] [NA] NA]	[X] *
COMPARE [/] []	[] []	[N]
RECOMMENDATIONS:	(If differen	t from NASA	.)	
[/] []	[] [] (AI	[] DD/DELETE)
* CIL RETENTION PREMARKS:	RATIONALE: (If	•	ADEQUATE NADEQUATE	
REF: RI/NASA CII	C OF 12-23-87 A	ND RI/NASA	CIL WORKSHE	EET OF 12-14-

ASSESSMEN									NASA DATA: BASELINE NEW	[, [x		
SUBSYSTEM MDAC ID:	1 :		259	FEEDL	(NE S	CREF	en						
LEAD ANA													
ASSESSMENT:													
CRITICALITY REDUNDANCY SCREENS CIL ITEM													
	A	A B				С							
NASA IOA	[1	/1 /1]	[NA] [NA] [NA] [NA] [NA]					NA] NA]	[X] ;]	k
COMPARE	[/]	[]	[1	[1	[N]	
RECOMMEN	IDATI	ONS	: (1	f dif	feren	t f	rom NA	SA)				
	[/	3	ſ	1	[]	[] (2		/DE] LE	TE)
* CIL RI	* CIL RETENTION RATIONALE: (If applicable) ADEQUATE [] INADEQUATE []												
REMARKS REF: R	: I/NAS	SA C	IL OF	12-23	3-87 <i>I</i>	AND	RI/NAS	SA	CIL WORKS	HEE	тС	F	12-11-

ASSESSM ASSESSM NASA FM	ID:	26/88 S-260} 34 - 2	-260X BASELINE (
SUBSYST MDAC ID ITEM:			MPS 260 LO2	_	LINE	SCRI	EEN					
LEAD AND	ALY	ST:	W.J	J. MCN	ICOL	<u></u>						
ASSESSMI	ENT	:										
	CR	ITICA FLIG	LITY		REDUI	NDANC	CY SCI	REENS		CIL		
	HDW/FUNC						В		С	ITEM		
NASA IOA	[1 /1 1 /1]		NA] NA]]	NA] NA]	[NA] NA]	[X]*		
COMPARE	[/	J	[)	[]	[]	[N]		
RECOMMEN	DA'	rions	: (If di	ffere	nt f	rom N	ASA)				
	[/]	C]	[]	[-	[] (ADD/DELETE)		
* CIL RE	TEN	TION	RATIO	ONALE:	(If	app	licab	2	ADEQUATE ADEQUATE			
	/NA	SA C	L OF	12-23	-87	AND 1	RI/NA	SA CI	L WORKS	HEET OF 12-1	L-	

ASSESSMENT DATE: 1/26/8 ASSESSMENT ID: MPS-26 NASA FMEA #: 0458-1					NASA DATA: X BASELINE [] NEW [X]								
SUBSYSTE MDAC ID:			MPS 261 LO2	LINE	ASSE	MBLY	(PD1	то	CV12 &	RP1	то	CV10)	
LEAD ANA	EAD ANALYST: W.J. MCNICOLL												
ASSESSMENT:													
CRITICALITY REDUNDANCY SCREENS CIL ITEM													
		A		В		С							
NASA IOA	[1 [1	/1 /1]] [NA] NA]] [NA] NA]] [NA] NA]		[X] *]	
COMPARE	C	/]	[]	[]	[]		[N]	
RECOMMEN	NDATI	ons:	(I	f di	ffere	nt f	rom N	ASA)					
	[/]	[]	[]	[]		[D/D] ELETE)	
* CIL RI		ION	RATIC	NALI	E: (If	app	licab		ADEQU <i>I</i> IADEQU <i>I</i>		[]	
REMARKS: REF: RI/NASA CIL OF 12-23-87 AND RI/NASA FMEA/CIL MEETING									NG NOT	ES.			

ASSESSMENT ASSESSMENT NASA FMEA	r ID:	MPS-262		NASA DATA: BASELINE [] NEW [X]							
SUBSYSTEM: MDAC ID: ITEM: FCV		MPS 262 GO2 PRE	SSURIZAT	'ION SUPPI	Y LINE, .63	" DIA, CV TO					
LEAD ANALYST: W.J. MCNICOLL											
ASSESSMENT	ASSESSMENT:										
CI	CIL ITEM										
NASA (1 /1] [NA] NA]	[NA] [NA]	[NA] [NA]	[X] *					
COMPARE	. /] []	[]	[]	[N]					
RECOMMENDA	ATIONS:	(If d	ifferent	from NAS	A)						
[. /] []	[]		[] DD/DELETE)					
* CIL RETE	ENTION F	RATIONALI	E: (If a) ADEQUATE INADEQUATE	[]					
	NASA CII	OF 12-2	23-87 AN	D RI/NASA	FMEA/CIL M	EETING NOTES.					

ASSESSME ASSESSME NASA FME	NT I		•	53X	:		NASA DATA: BASELINE [] NEW [X]						
SUBSYSTE MDAC ID: ITEM: PD4)			MPS 263 GO2 PI	RES	SURIZA	TION	SUP	brā	LINE (L	753	, 5	4,	55 TO
LEAD ANALYST: W.J. MCNICOLL													
ASSESSMENT:													
CRITICALITY RED FLIGHT HDW/FUNC A						DUNDANCY SCREENS CIL B C							
NASA IOA	[1	/1 /1]	[NA] NA]	[N	IA] IA]	[NA] NA]		[X []	*
COMPARE	[/	3	[1	[1	[1		[N]	
RECOMMEN	IDATI	ons:	(If	d:	iffere	nt fr	om N	ASA)					
	[/]	[]	[]	[1	(AD	[D/D		ETE)
* CIL RI		ON	RATION	AL	E: (If	appl	licab		ADEQUAT IADEQUAT		[]	
REMARKS	: [/NAS	A CI	L OF 1	2-	23-87	AND F	RI/NA	SA E	MEA/CIL	ME	ETI	NG	NOTES.

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	MPS-264			NASA DATA: BASELINE [] NEW [X]					
MDAC ID:	MPS 264 GO2 PRE	SSURIZA'	TION SUP	PLY LINE (CV	/16 TO PD9)				
LEAD ANALYST:	W.J. MC	NICOLL							
ASSESSMENT:									
CRITICAL FLIGH		REDUNDA	ANCY SCR	EENS	CIL ITEM				
HDW/FU	NC	A	В	С					
NASA [3 /1R IOA [2 /1R] [P] P]	[F] [F]	[P] [P]	[X] * []				
COMPARE [N /] [1	[]	[]	[и]				
RECOMMENDATIONS:	(If d	ifferent	from N	ASA)					
[2 /1R] [P]	[F]	[P]	[] (ADD/DELETE)				
* CIL RETENTION	RATIONALI	E: (If a	applicab:						
DEMA DVC .				ADEQUATE INADEQUATE					
REMARKS: SECOND FAILURE WI REF: RI/NASA CII	ILL ALLOW L OF 12-2	V LEAKAG 23-87.	GE OF GO	2 INTO AFT C	OMPARTMENT.				

ASSESSMENT DATE: 1/27/88 ASSESSMENT ID: MPS-265X NASA FMEA #: 0515-1						NASA DATA: BASELINE [] NEW [X]												
SUBSYSTEM MDAC ID: ITEM:	1:		265								TION	IER	Ł					
LEAD ANA	LYST	:	W.J	. MCN	ICOL	L												
ASSESSMENT:																		
			ITY		REDU	NDAN	CY	SCF	REENS	5			CI	[L [EM	Ī			
		LIGH W/FU			A		В			С								
NASA IOA	[2 [2	/1R /1R	i]]	P] P]]]	F F]	[P P]		[X]	*		
COMPARE	[/]	[3	(]	[]		[N]			
RECOMMEN	DATI	ONS:	. (If d	iffe	rent	fr	om 1	NASA)								
	[/]	[]	[]	ĺ]	(A		/DI		ETE)	I	
* CIL RE	CTENT	NOI	RATI	ONAL	E: (If ap	pl	ica		A	DEQUA]			
REMARKS: REF: RI NOTES.	: [/NAS	SA C	IL OF	F 12-	23-8	7 ANI) R	I/N	ASA	FM]	EA/C	IL R	EV	ΊE	W 1	MEE	ring	

ASSESSMI	ENT DATE: ENT ID: EA #:	MPS-266	8 6X	NASA DATA: BASELINE [] NEW [X]							
SUBSYSTI MDAC ID: ITEM:		MPS 266 LO2 ULI	LAGE PRI	ESSURE SIG	GNAL CONDITION	-					
LEAD ANA	ALYST:	W.J. MC	CNICOLL								
ASSESSME	ENT:										
	CRITICAL FLIGH HDW/FU	Γ	REDUNI A	DANCY SCRI	CENS	CIL ITEM					
NASA IOA	[2 /1R [3 /3] [P] NA]	[F] [NA]	[P] [NA]	[X] *					
COMPARE	[N /N] [N]	[N]	[N]	[N]					
RECOMMEN	DATIONS:	(If d	ifferen	t from NÀ	SA)						
	[3 /3] [NA]	[NA]	•	[D] .DD/DELETE)					
* CIL RE	rention R	RATIONAL	E: (If	applicabl	e) ADEQUATE						
REMARKS:					INADEQUATE	į					
THE RI/NATO THE LA	ASA ANALY 12 ULLAGE	SIS IND	CATES !	THAT THE	2/1R CRITICA	LITY APPLIE					

ES TO THE LH2 ULLAGE PRESSURE SIGNAL CONDITIONER ONLY. FOR LO2 THERE WOULD BE NO EFFECT. REF: RI/NASA CIL OF 12-23-87 AND RI/NASA FMEA/CIL REVIEW MEETING NOTES.

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	MPS-267X	1	NASA DATA: BASELINE NEW	[x]								
SUBSYSTEM: MDAC ID: ITEM:	MPS 267 LO2 ULLAGE	PRESSURE SIGNAL	CONDITION	ER								
LEAD ANALYST:	W.J. MCNICO	OLL										
ASSESSMENT:												
CRITICALITY REDUNDANCY SCREENS CIL FLIGHT ITEM HDW/FINC A B C												
HDW/FU		В	С									
NASA [2 /1R IOA [2 /1R] [P]] [F] [] [F] [P] P]	[X] *								
COMPARE [/) (] [] []	[N]								
RECOMMENDATIONS:	(If diffe	erent from NASA)										
[/] [] [] [] (AI	[] DD/DELETE)								
* CIL RETENTION	RATIONALE:		ADEQUATE ADEQUATE	[]								
REMARKS: REF: RI/NASA CI NOTES.	L OF 12-23-	87 AND RI/NASA F	MEA/CIL RI	EVIEW MEETING								

ASSESSMEN ASSESSMEN NASA FMEA	NT ID:	1/27/88 MPS-2682 0522-1	X	NASA DATA: BASELINE [] NEW [X]								
SUBSYSTEM MDAC ID:	1:	MPS 268 GO2 PRES	SSURIZAT	ION SUPP	LY LINE							
LEAD ANAI	LYST:	W.J. MCI	NICOLL									
ASSESSMEN	NT:											
CRITICALITY REDUNDANCY SCREENS CIL FLIGHT ITEM HDW/FUNC A B C												
	HDW/FUI	NC	A	В	С							
NASA IOA	[1 /1 [1 /1] [NA] NA]	[NA] [NA]	[NA] [NA]	(X] *						
COMPARE	[/] []	[]	[]	[N]						
RECOMMEND	DATIONS:	(If di	ifferent	from NA	SA)							
	[/] [3	()		[] DD/DELETE)						
* CIL RET	TENTION I	RATIONALE	E: (If a	pplicable	ADEQUATE	[]						
	'NASA CII	L OF 12-2	23-87 AN	D RI/NASA	A FMEA/CIL R	EVIEW MEETING						

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	1/27/88 MPS-269X 0607-1	NASA DATA: BASELINE [] NEW [X]										
SUBSYSTEM: MDAC ID: ITEM:	MPS 269 LO2 SENSE LI	NE (PD1 TO PR	5)									
LEAD ANALYST:	W.J. MCNICOL	L										
ASSESSMENT:												
CRITICALITY REDUNDANCE SCREENS ITEM												
FLIGH HDW/F		В	С									
NASA [1 /1 IOA [1 /1] [NA]] [NA]	[NA] [NA]	[NA] [NA]	[X] * []								
COMPARE [/] []	[]	[]	[N]								
RECOMMENDATIONS	: (If differ	cent from NAS	A)									
[/] []	[]	[]	[] ADD/DELETE)								
* CIL RETENTION	* CIL RETENTION RATIONALE: (If applicable) ADEQUATE [] INADEQUATE []											
REMARKS: REF: RI/NASA (REF: RI/NASA CIL OF 12-23-87 AND RI/NASA CIL											

ASSESSM ASSESSM NASA FM	ENT	"ID:	1/27 MPS- 0626	270	ζ.			NASA DATA: BASELINE [] NEW [X]					
SUBSYST MDAC ID ITEM:			MPS 270 LO2	ENGI	NE I	NLET	PRES	SURE	TRAN			•	
LEAD AN	ALYS	T:	W.J.	MCN	ICOL	L							
ASSESSM	ENT:												
		TICAI FLIGH			REDU! A	NDAN	CY SCI B		c		CI:		
NASA IOA	[3 /3 3 /3]	[NA] NA]	[NA] NA]	[] []	NA] NA]		[]	*
COMPARE	(/]	ſ]	[]	[]		[)	
RECOMMEN	IDAT:	IONS:	(II	di	ffere	ent f	rom N	ASA)					
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* CIL RE REMARKS: REF: RI			RATION EA/CIL					A INA	DEQU DEQU		[]	

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	MPS-271X	1PS-271X PASEITING NET							
SUBSYSTEM: MDAC ID: ITEM:	MPS 271 LO2 MANIFOLD	PRESSURE TRANS	DUCER						
LEAD ANALYST:	W.J. MCNICOL	L							
ASSESSMENT:									
CRITICAL	CIL ITEM								
FLIGH HDW/FU		в	!						
NASA [3 /1R IOA [3 /3] [P]] [NA]	[F] [F] [NA] [N	[X] * []						
COMPARE [/N] [N]	[и] [и	[и]						
RECOMMENDATIONS:	(If diffe	rent from NASA)							
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* CIL RETENTION	RATIONALE: (4	ADEQUATE [] ADEQUATE []						
REMARKS: RELIEF SYSTEM WI REDUNDANCY FOR TREF: RI/NASA CT	IN ANCOUNTED TA	TTHE	RUPTURE. NO						

ASSESSM	SMENT DATE: 1/27/88 SMENT ID: MPS-272X FMEA #: 0626-7						NASA DATA: BASELINE [] NEW [X]								
SUBSYSTI MDAC ID: ITEM:			MPS 272 GO2	DISC	ONNE	CT P	RESSUI	RE TR	ANSDUC	CER					
LEAD AND	ALYS	r:	W.J.	MCN	ICOL	L									
ASSESSMI	ENT:														
	I	TICAL FLIGH DW/FU	_		REDUI A	NDANG	CY SCR		2		CIL				
NASA IOA	[3	3 /3]	[]	NA] NA]	[NA] NA]		NA] NA]		[]	*		
COMPARE	£	/]	[]	[]	[]		[)			
RECOMMEN	DATI	ONS:	(I	f di	ffere	ent f	rom N	ASA)							
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* CIL RE REMARKS: REF: RI			RATION EA/CII					INA	DEQUA DEQUA		[]			

ASSESSME ASSESSME NASA FME	NT I	D:	MPS-	273X			NASA DATA: BASELINE [] NEW [X]								
SUBSYSTE MDAC ID: ITEM:			MPS 273 LO2	ENGIN	E IN	LET T	EMPE	RATUR	E TRAN	SDU	CE	R			
LEAD ANA	LYST	:	w.J.	MCNI	COLI										
ASSESSME	NT:														
				R	EDUN	IDANCY	SCR	REENS			CI		r		
	_	LIGH W/FU		A		В		С			11	ĮĽ.	L		
NASA IOA	[2	/1R /1R]	[P]	[F]	[P]		[X]	*	
COMPARE	[/]	[]	[]	[]		[N]		
RECOMMEN	IDATI	ons:	(I	f dif	fere	ent fr	om N	NASA)							
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* CIL RE		NOI	RATIO	NALE:	(11	f appl	icab	A	DEQUAT DEQUAT]		
REMARKS: REF: RI NOTES.		A CI	L OF	12-23	-87	AND R	I/NZ	ASA FM	EA/CII	RE	EVI	EV	J I	MEETING	

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:			NASA DATA: BASELINE [] NEW [X]									
MDAC ID:	MPS 274 GO2 ENGIN	NE OUTLE	T TEMPER	RATURE TRANS	DUCER							
LEAD ANALYST:	W.J. MCNI	COLL										
ASSESSMENT:												
CRITICAL FLIGH	ITY F	REDUNDAN	ICY SCREE	ens	CIL ITEM							
HDW/FU	NC A	A	В	С								
NASA [2 /1R IOA [3 /1R] []	?] ([F] [F]	[P] [P]	[X] *							
COMPARE [N /] [] ([]	[]	[N]							
RECOMMENDATIONS:	(If dif	fferent	from NAS	SA)								
[3 /1R] []	?] [[F]		[] ADD/DELETE)							
* CIL RETENTION	RATIONALE:	: (If ap	plicable	e) ADEQUATE INADEQUATE	[]							
REMARKS: RI/NASA FMEA/CIL	REVIEW ME	EETING N	NOTES POS	TULATE LEAF	AGE OF THE							

ANTI-FLOOD VALVE IN COMBINATION WITH TRANSDUCER FAILURE. THIS VIOLATES NSTS 22206 2.3.2d, THE REQUIREMENT THAT INTERFACING SUBSYSTEMS WILL BE CONSIDERED TO BE OPERATING WITHIN THEIR SPECIFIED TOLERANCES. MULTIPLE FAILURES CAN ALLOW ENGINE START WHEN CONDITIONS ARE NOT ACTUALLY WITHIN LIMITS. REF: RI/NASA CIL OF 12-23-87 AND RI/NASA FMEA/CIL REVIEW MEETING NOTES.

ASSESSME ASSESSME NASA FME	ENT	II):	MPS	IPS-275X BASELINE []										
SUBSYSTE MDAC ID: ITEM: TRANSDUC	:			MPS 275 LO2		AM C	NIFOI	ď	DISC	ONNE	CT T	EMPER	ATUR	E	
LEAD ANA	ALYS	ST:	:	W.J	. MCN	1ICO	LĽ								
ASSESSME	ENT :	:													
		FI	LIGH	T			UNDAN						CIL		
	F	HDV	/FU	NC		A			В		С				
NASA IOA	[3 3	/3 /3]	[NA] NA]	i 1		NA] NA]	[NA] NA]		[[] ;	*
COMPARE	[/]	[]	I	•]	[3		[]	
RECOMMEN	NDA:	ric	ons:	(If d	iffe	rent	f	rom N	IASA)	ı				
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REMARKS: RI/NASA THIS ASS	ANA IMUS	ED	FAI	LURE	OF :	THE	ENGI	ΙE	BLEE	PAD A	ABORT	(PRE	LAUN H VI	(CH)	TES

NSTS 22206 2.3.2d, THE REQUIREMENT THAT INTERFACING SUBSYSTIWILL BE CONSIDERED TO BE OPERATING WITHIN THEIR SPECIFIED TOLERANCES. REF: RI/NASA CIL OF 12-23-87 AND RI/NASA FMEA/CIL REVIEW MEETING NOTES.

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	MPS-276X	S-276X BASELINE []									
	MPS 276 LO2/LH2	NAFLEX FI	LANGE FAC	E SEALS							
LEAD ANALYST:	W.J. MCN	ICOLL									
ASSESSMENT:											
CRITICAL FLIGH		REDUNDANG	CY SCREEN	rs	CIL ITEM						
	NC	A									
NASA [1 /1 IOA [1 /1] [NA] [NA] [NA] [NA] [NA] NA]	[X] *						
COMPARE [/] [] [] []	[N]						
RECOMMENDATIONS:	(If di	fferent i	from NASA	.)							
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* CIL RETENTION	RATIONALE	: (If app	•	ADEQUATE	[]						
REMARKS:			I	NADEQUATE	[]						
REF: RI/NASA CI:	L OF 12-2	23-87 AND	RI/NASA	CIL WORKSHI	EET OF 12-14-						

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	MPS-277	PS-277X BASELINE []								
	MPS 277 LO2/LH2	METALLIC	BOSS SEAT	LS (K SEALS	5)					
LEAD ANALYST:	W.J. MCN	ICOLL								
ASSESSMENT:										
CRITICAL FLIGH		REDUNDANG	CY SCREENS	S	CIL ITEM					
	NC	A								
NASA [1 /1 IOA [1 /1] [NA] [NA] [NA] [NA] [NA] NA]	[X] * []					
COMPARE [/] [] [] [1	[и]					
RECOMMENDATIONS:	(If d	ifferent 1	from NASA)						
(/] [] [] [] (Al	[] DD/DELETE)					
* CIL RETENTION	RATIONALI	E: (If app	•	ADEQUATE NADEQUATE						
REMARKS: REF: RI/NASA CI 87.	L OF 12-2	23-87 AND			EET OF 12-14-					

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	MPS-278		NASA DATA: BASELINE [] NEW [X]								
	MPS 278 GO2/GH2	K SEALS									
LEAD ANALYST:	W.J. MC	NICOLL									
ASSESSMENT:											
CRITICAL FLIGH		REDUNDAN	CY SCREE	ens	CIL ITEM						
	NC	A	В	С	IIEM						
NASA [1 /1 IOA [1 /1] [NA] [NA] [NA] NA]	[NA] [NA]	[X] *						
COMPARE [/] [] [1	[]	[и]						
RECOMMENDATIONS:	(If d	ifferent	from NAS	A)							
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* CIL RETENTION	RATIONAL	E: (If ap	plicable								
				ADEQUATE INADEQUATE	[]						
REMARKS: REF: RI/NASA CI MEETING NOTES.	L OF 12-	23-87 AND	RI/NASA	CIL FMEA/C	IL REVIEW						

	1/27/88 MPS-279X 0707-1	S-279X BASELINE [] 07-1 NEW [X]								
SUBSYSTEM: MDAC ID: ITEM:	MPS 279 GO2/GH2	NAFLEX 1	FLANGE FA	CE SEALS						
LEAD ANALYST:	W.J. MC	NICOLL								
ASSESSMENT:										
CRITICAL		REDUNDA	NCY SCREE	NS	CIL ITEM					
FLIGH HDW/FU		A	В	С						
NASA [1 /1 IOA [1 /1] [NA] NA]	[NA] [NA]	[NA] [NA]	[X] *					
COMPARE [/] [1	[]	[]	[N]					
RECOMMENDATIONS:	(If d	ifferent	from NAS	A)						
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* CIL RETENTION	RATIONAL	Æ: (If a	applicable	ADEQUATE						
REMARKS: REF: RI/NASA FI	MEA/CIL R	REVIEW ME	ETING NOT	ES.						

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	1/27/88 MPS-280X 0301-8		ASA DATA: BASELINE [] NEW [X]
SUBSYSTEM: MDAC ID: ITEM:	MPS 280 LH2 INBOARD FIL	L AND DRAIN 7	VALVE (PV12)
LEAD ANALYST:	W.J. MCNICOLL		
ASSESSMENT:			
CRITICALI FLIGHT HDW/FUN	r	NCY SCREENS B C	CIL ITEM
NASA [3 /3 IOA [3 /3] [NA]] [NA]	[NA] [NA] [NA]	
COMPARE [/] []] [] []
RECOMMENDATIONS:	(If different	from NASA)	
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ASSESSME ASSESSME NASA FME	NT I	D:	MPS-2	31X					SA DAT BASELIN NE			
SUBSYSTE MDAC ID: ITEM:			MPS 281 LH2 II	NBOA	RD F	ILL A	ND D	RAIN V	ALVE ((PV12)	ı	
LEAD ANA	LYSI	P:	W.J. 1	MCNI	COLL							
ASSESSME	NT:											
	I	LIGH'				DANCY B		EENS C		CII		
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RECOMMEN	DAT]	cons:	(If	dif	fere	nt fr	om N	IASA)				
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* CIL RE		TION I	RATION	ALE:	(If	appl	icab	AI	DEQUATI DEQUATI]	
REMARKS: REF: RI 87.		SA CI	L OF 1	2-23	8-87	AND R	I/NA	SA CII	L WORKS	SHEET	OF	11-23-

ASSESSME	איר דו	D:	MPS-28									ASA DATA BASELINE NEW	[
SUBSYSTE MDAC ID: ITEM:			MPS 282 LH2 IN	NBO	DAI	RD FII	ĽL	Al	ID DRA	AIN	, I	/ALVE				
LEAD ANA	LYST	:	W.J. 1	1Cì	VI(COLL										
ASSESSMENT:																
CRITICALITY REDUNDANCY SCREENS FLIGHT										CIL ITEM						
			NC		A			В			С		1.	LEI	1	
NASA IOA	[2 [2	/1R /1R]	[P P]]	P P]	[P P]	[X]	*
COMPARE	[/]	[]	[]	[1	[N]	
RECOMMEN	DATI	ons:	(If	ď	ifí	ferent	: 1	fro	om NAS	SA)						
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REMARKS:										IN	Άľ	DEQUATE DEQUATE	[]	
RI/NASA ABORTS.			IDENT	[F]	ŒS	5 A 1/	1	CF	RITICA	\LI	TY	FOR RT	LS	Αì	1D	TAL
REF: RI				2-2	23-	-87 AN	ID	R)	/NASA	A C	ΞI	WORKSHI	EET	r (F	11-23-

ASSESSMEN ASSESSMEN NASA FMEA	T IC):	MPS-	08-1 BASEBING [X]														
SUBSYSTEM MDAC ID: ITEM:	ſ:		MPS 283 LH2	INBO	AR	D F	ILL	AN	D DI	RAIN	V .	ALVE	(PV	'12)			
LEAD ANAI	LYST	:	W.J	. MCN	IIC	OLL												
ASSESSME	NT:																	
(ICAL			RE	DUN	DANC	Y	SCR	EENS	5			CI	L EM	i		
		LIGHT W/FU			A			В			С							
NASA IOA	[/1R /]	[NA]	[[NA	\]]	[NA]		[X]	*	
COMPARE	C	/N]	[N]	[N	3	[N]		[N]		
RECOMMEN	DATI	ons:	(If d	ifi	ere	ent :	fro	om N	IASA)							
	[]				[]	(A		D DI		ETE)	
* CIL RE	TENT	NOI	RATI	ONAL	E:	(II	f ap	pl.	icab			DEQU <i>I</i>]		
REMARKS: THIS FAI INDICATI		E MOD (0301	E SI -3)	HOULD AND	B LO	E AI	DEQU OF P	AT OS	ELY ITIC	ADD I NC	RE: ND	SSED ICATI	UND [ON	ER (0	E] 3 0 :	RR(ONEC 8).	ous

ASSESSM ASSESSM NASA FM	ENT :	ID:	_,	284X			NASA DATA: BASELINE [] NEW [X]						
SUBSYST MDAC ID ITEM:			MPS 284 LH2	OUTB	OARD	FILI	AND	DRAI	N VAI	VE (PV1:	1)	
LEAD AN	ALYSI	r:	W.J.	MCN	COL	C							
ASSESSMI	ENT:												
	F	TICAI FLIGH W/FU	T		REDUI		Y SCR		c		CII		
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IOA	[3	/3]	1] 1]	IA] IA]	[NA] NA]		NA] NA]		[] *]	
COMPARE	[/]	[]	[]	[]		[]	
RECOMMEN	DATI	ONS:	(I	f dif	fere	nt f	rom N	ASA)					
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ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:		S-285X BASELINE []							
MDAC ID:	MPS 285 LH2 OUTBO	ARD FILL	AND DRAI	IN VALVE (P	V11)				
LEAD ANALYST:	W.J. MCNI	COLL							
ASSESSMENT:									
	ITY F	REDUNDANC	Y SCREENS		CIL ITEM				
FLIGH HDW/FU			В	С					
NASA [2 /1R IOA [2 /1R] [F	?][F] [F] [F] F]	[X] * []				
COMPARE [/] [] [] []	[и]				
RECOMMENDATIONS:	(If dif	fferent f	rom NASA)					
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* CIL RETENTION	RATIONALE:	: (If app		ADEQUATE NADEQUATE	[]				
REMARKS: REF: RI/NASA CI 87.	L OF 12-23	3-87 AND	RI/NASA (CIL WORKSHE	EET OF 11-24-				

ASSESSME ASSESSME NASA FME	NT I	D:	MPS-2	PS-286X					NASA DATA: BASELINE [] NEW [X]					
SUBSYSTE MDAC ID:			MPS 286 LH2 O	UTBO	ARD :	AIN V	ALVE	(PV1	1)					
LEAD ANA	LYST	:	W.J. 1	MCNI	COLL									
ASSESSME	NT:													
	F	LIGH:				_		EENS			CI IT		Į.	
	HD	W/FUI	NC	А		В		С						
NASA IOA	[2 [2	/1R /1R]	[P]	[P]	[P [P]		[X]	*
COMPARE	[/]	[]	ľ]	[]		(N]	
RECOMMEN	DATI	ons:	(If	dif	fere	nt fr	om N	ASA)						
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REMARKS: REF: RI 87.	/NAS	A CII	L OF 12	2-23	-87 2	AND R	I/NA	SA CI	L WORI	(SHE	ET	0	F	11-24-

ASSESSMEN' ASSESSMEN' NASA FMEA	T ID:			7X		NASA DATA: BASELINE [] NEW [X]									
SUBSYSTEM MDAC ID: ITEM:	:		MPS 287 LH2 OU	TBOA	RD FI	LL 8	DRAI	n VA	LVE (PV	11)					
LEAD ANAL	YST:		W.J. M	CNIC	OLL										
ASSESSMEN	T:														
CRITICALITY REDUNDANCY SCREENS CIL FLIGHT ITEM															
HDW/FUNC A B C															
NASA IOA	[/	′1R ′]	[]	[]	[]	[[X]	*		
COMPARE	[/	'N]	[]		3	(3	[N]			
RECOMMEND	OITA	is:	(If	diff	ferent	fre	om NAS	SA)							
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INDICATIO															

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	MPS-288X	NASA DA BASELI N									
MDAC ID:	MPS 288 LH2 FILL & DE	RAIN DISCONNECT (PD11	L)								
LEAD ANALYST:	W.J. MCNICOLI	L C									
ASSESSMENT:											
CRITICAL: FLIGHT		NDANCY SCREENS	CIL ITEM								
HDW/FUI	NC A										
NASA [1 /1 IOA [1 /1] [NA]] [NA]	[NA] [NA] [NA] [NA]	[X] * []								
COMPARE [/] []	[] []	[N]								
RECOMMENDATIONS:	(If differe	ent from NASA)									
[/] []	[] []	[] (ADD/DELETE)								
* CIL RETENTION I	CIL RETENTION RATIONALE: (If applicable) ADEQUATE [] INADEQUATE []										
REMARKS: REF: RI/NASA CII 87.	L OF 12-23-87	AND RI/NASA CIL WORK	•								

ASSESSMENT DA ASSESSMENT ID NASA FMEA #:	•			NASA DAT BASELIN NE]
SUBSYSTEM: MDAC ID: ITEM:	MPS 289 LH2 FI	LL & DRA	IN DISCON	NECT (PD11)		
LEAD ANALYST:	W.J. M	CNICOLL				
ASSESSMENT:						
	CALITY JGHT	REDUNDA	ANCY SCRI	EENS	CIL ITEN	м
	/FUNC	A	В	С		
NASA [3 IOA [3	/3] /3]	[NA] [NA]	[NA] [NA]	[NA] [NA]	[] *
COMPARE [/ 1	[]	[]	[]	[]
RECOMMENDATIO	NS: (If	differen	t from N	ASA)		
(/]	[]	[]	[]	[(ADD/D	-
* CIL RETENTI	ON RATIONA	LE: (If	applicab	le) ADEQUATE INADEQUATE]
REMARKS: REF: RI/NASA	FMEA/CIL	REVIEW M	EETING N	OTES.		

SUBSYSTEM: MDAC ID:	MPS-290X 0303-4 MPS 290	PS-290X BASELINE [303-4 NEW [PS 90 12 FILL & DRAIN DISCONNECT (PD11)								
LEAD ANALYST:		•	•							
ASSESSMENT:										
CRITICAL: FLIGHT HDW/FUI		ANCY SCREENS B C	CIL ITEM							
NASA [3 /3 IOA [3 /3] [NA]] [NA]	[NA] [NA] [NA]	[] *							
COMPARE [/] []	[] []	[]							
RECOMMENDATIONS:	(If different	t from NASA)								
[/] []	[] []	[] (ADD/DELETE)							
* CIL RETENTION I REMARKS: REF: RI/NASA FMI	RATIONALE: (If a	ADEQU INADEQU	JATE [] JATE []							

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	1/28/88 MPS-291 0303-5	3		NASA DATA: BASELINE NEW		
SUBSYSTEM: MDAC ID: ITEM:	MPS 291 LH2 FILI	L & DRAIM	I DISCONN	ECT (PD11)		
LEAD ANALYST:	W.J. MCI	NICOLL				
ASSESSMENT:						
CRITICAL		REDUNDA	NCY SCREE	ens	CIL ITEM	
FLIGH HDW/FU		В	С			
NASA [3 /3 IOA [3 /3] [NA] NA]	[NA] [NA]	[NA] [NA]	[] *
COMPARE [/] []	[]	[]	[]
RECOMMENDATIONS	: (If d	ifferent	from NAS	SA)		
[/] [1	[]	[] (A	DD/DE] ELETE)
* CIL RETENTION	RATIONAL	E: (If a	pplicabl	e) ADEQUATE INADEQUATE]
REMARKS: REF: RI/NASA F	MEA/CIL F	REVIEW ME	ETING NO	TES.		

ASSESSMI NASA FMI	ENT ID:	: MPS-	MPS-292X BASELINE ()							
SUBSYSTI MDAC ID: ITEM:		MPS 292 LH2	HI PO	INT BLE	ED DIS	CONNECT	' (PD17)		
LEAD ANA	ALYST:	W.J.	MCNI	COLL						
ASSESSME	ENT:									
	FLI	CALITY IGHT		EDUNDAN	CY SCR	EENS		CII		
	HDW/	FUNC	A		В	C				
NASA IOA	[1 /	(1] (1]	[N2	A] [A] [NA] NA]	[NA] [NA]		[]	()]	*
COMPARE	[/	']	[) []	[]		[]	1]	
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REMARKS: REF: RI 87.	/NASA	CIL OF	12-23 -	87 AND	RI/NA		QUATE YORKSHE	•] OF	11-13-

ASSESSME ASSESSME NASA FME	NT ID:		MPS-293X BASELINE []						
SUBSYSTE MDAC ID: ITEM:		MPS 293 LH2 HI	POINT BI	EED DISC	CONNECT (PD1	7)			
LEAD ANA	LYST:	W.J. MC	NICOLL						
ASSESSME	NT:								
	CRITICAL FLIGH	IT	REDUNDA A	ANCY SCRI	eens C	CIL ITEM			
NASA IOA	•] [NA] NA]	[NA] [NA]	[NA] [NA]	[X] *			
COMPARE	[/) []	[]	[]	[N]			
RECOMMEN	DATIONS:	(If d	lifferent	t from N	ASA)				
	[/] (1	[]	[] ([] ADD/DELETE)			
* CIL RE	TENTION	RATIONAL	Æ: (If a	applicab	le) ADEQUATE INADEQUATE				
REMARKS: REF: RI 87.	/NASA C	IL OF 12-	-23-87 A	ND RI/NA	SA CIL WORKS	HEET OF 11-13			

ASSESSME	SSESSMENT DATE: 1/28/88 SSESSMENT ID: MPS-294X ASA FMEA #: 0304-3						NASA DATA: BASELINE [] NEW [X]								
SUBSYSTE MDAC ID:			MPS 294 LH2	REPLE	NISH	I VAI	LVE (P	V 13)	ı.						
LEAD ANA	LYST	:	W.J.	MCNI	COLI	,									
ASSESSME	NT:														
	F	ICAL LIGH W/FU	T	R		IDANC	CY SCR B	EENS	c c	CI					
NASA IOA	[3	/3 /3]	[N	A]]	NA] NA]	[NA] NA]	[] *				
COMPARE	[/]	[]	[]	[]	[]				
RECOMMEN	DATI	ONS:	(I	f dif	fere	nt f	from N	ASA))						
	[/]	[]	[]	[[(ADD/] DELETE				
* CIL RE	TENT	NOI	RATIO	NALE:	(If	app	olicab		ADEQUATI IADEQUATI]				

REF: RI/NASA FMEA/CIL REVIEW MEETING NOTES.

ASSESSME ASSESSME NASA FME	II	D:	MPS	1/28/88 NASA DATA: MPS-295X BASELINE [] 0304-6 NEW [X]									
SUBSYSTE MDAC ID:				MPS 295 LH2	j	LENISH	VAL	VE (P	V13)				
LEAD ANA	LYS	3 T :	:	W.J	. MCN	ICOLI							
ASSESSMENT:													
	CR		ICAI LIGH			REDUN	IDANC	Y SCR	EENS	;		CII	
	I	IDI	W/FU	NC		A		В		С			
NASA IOA	[[3 3	/3 /3]]	NA]	[NA] NA]	[[NA] [NA]] *]
COMPARE	ĺ		/	3	[]	[]	[]		(]
RECOMMEN	DA'	ric	ons:	: ((If di	iffere	ent f	rom N	(ASA)				
	/]	[]	[1	[]	(A	-] DELETE)		
* CIL RE		NT:	ION	RAT	CONALI	E: (If	app	licab		ADEQUA IADEQUA	TE TE	[]
REMARKS: REF: RI		AS	A FI	IEA/C	CIL RI	EVIEW	MEET	ING N	OTES	S.			

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	1/28/88 MPS-296X 0304-11	:		NASA DATA BASELINE NEW	-
MDAC ID:	MPS 296 LH2 REPL	ENISH V	ALVE (PV	13)	
LEAD ANALYST:	W.J. MCN	ICOLL			
ASSESSMENT:					
CRITICAL FLIGH		REDUNDA	NCY SCRE	ens	CIL ITEM
HDW/FU		A	В	С	IIEM
NASA [2 /1R IOA [2 /1R] [P] P]	[F] [P]	[P] [P]	[X] *
COMPARE [/] []	[N]	[]	[N]
RECOMMENDATIONS:	(If di	fferent	from NA	SA)	
[2 /1R] [P]	[P]		[] DD/DELETE
* CIL RETENTION	RATIONALE	: (If a	pplicable	•	
REMARKS:				ADEQUATE INADEQUATE	[]
HELIUM TANK PRESS			ND ALARM: 12-23-87		SSAGE OF

ASSESSMEN ASSESSMEN NASA FMEA	T ID:	1/28/8 MPS-29 0431-3	7X			NASA DATA: BASELINE [] NEW [X]								
SUBSYSTEM MDAC ID:	:	MPS 297 LH2 H	[PO]	INT B	LEED	VALV	E (PV22)						
LEAD ANAI	YST:	W.J. 1	(CNI	COLL										
ASSESSMEN	ASSESSMENT:													
CRITICALITY REDUNDANCI SCREEKS ITEM														
	FLIGHTOW/F				С									
NASA IOA	[3 /3 [3 /3]	[N	A] A]	[N.	A] A]	[NA] NA]	[] *				
COMPARE	[/]	[]	ſ	3	[]	[]				
RECOMMEN	DATIONS	: (If	dif	fere	nt fr	om N	ASA)						
	[/	1	[]	[]	[1	(ADD/D	ELETE)				
* CIL RE	TENTION	RATION	IALE	: (If	appl	icab.		ADEQUA']				
REMARKS: REF: RI	: [/NASA]	MEA/CI	L RE	VIEW	MEET	ING N	OTE	s.						

ASSESSM	ASSESSMENT DATE: 1/28/88 ASSESSMENT ID: MPS-298X NASA FMEA #: 0431-6 SUBSYSTEM: MPS									NASA DATA: BASELINE [] NEW [X]														
SUBSYST MDAC ID ITEM:		:			2	IPS 98 H2 H	I	PO	INT	BI.	Æ	ΕD	VA	LVI	E	(P	V 2:	2)				-		
LEAD AN	AL:	YS	T:	:	W	.J. 1	MC	NI	COL	L														
ASSESSM	ENT	r:																						
	CI		r L	CAI LIGH	IT	Y				NDA	NC		SC:	REE	N						IL TE			
				,,	/1 1 C		A						В С											
NASA IOA	-			/1 /			[N	A]		[[N?]	N	A]			[x]	*	
COMPARE	(ì	1	/N]		[N]		[N]		[N]			[N]		
RECOMMEN	IDA	T]	0	NS:		(If	di	fí	fere	ent	f	ro	m 1	NAS.	A)									
	[/]		[]	1]		[]		(A)		'DE] ELF	TE)
* CIL RE	TE	ΝΊ	'I	ON :	RAI	'IONA	LE	:	(If	f ar	าท	า เ	cah	ים ני					•	,				•
REMARKS:]	ΕN	AD	EQ	UAT UAT	Έ	[]		
THIS ANA DELETED.	LY:	SI RE	S F	IS :	A RI/	DUPL NASA	IC F	AT ME	E C	F C	4: RI	31 EV	-5. IEW	'ME	CH EE	IS TI	C: NG	IL NO	SHO TES	DUL	D	BE		

ASSESSMENT DATE: 1/28/88 ASSESSMENT ID: MPS-299X NASA FMEA #: 0431-7										NASA BASE	LINE]
SUBSYSTE MDAC ID:	M:			MPS 299 LH2	•	rnios	BLE	ED VA	LVE				
LEAD ANA	LYS	ST	:	W.S	J. MCN	ICOI	L						
ASSESSME	NT:	:											
		F	LIGH				INDAN	CY SCI	REENS			CII	
	I	HD	W/FU	INC		A		В	С				
NASA IOA	[[3 3	/3 /3]]	NA] NA]	[[NA]	[NA] NA]		[] *
COMPARE	[/]	ί]	C]	[]		[]
RECOMMEN	DA:	ΓI	ons:	, ,	(If d	iffer	rent	from 1	NASA)	l			
	[/]	[]	[]	[]	(A	[.DD/I] DELETE)
* CIL RE		NT:	ION	RAT	IONALI	E: (]	[f ap	plica		ADEQU VADEQU]
		AS.	A FN	ŒA/C	CIL R	EVIEV	MEE	TING :	NOTES	3.			

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ASSESSME ASSESSME NASA FME	NT I	D:		-300X				1	NASA DATA BASELINI NET]	
SUBSYSTE MDAC ID:			MPS 300 LH2	ні ро	INT	BLEE	D VAL	PV22)					
LEAD ANA	LYST	:	W.J	. MCNI	COLI	<u>.</u>							
ASSESSMENT:													
CRITICALITY REDUNDANCY SCREENS CIL FLIGHT ITEM													
NASA IOA	[1	/1]	7] 7]	IA] IA]	[]	NA] NA]	[] []	NA] NA]	[X]	*
COMPARE	[/)	[]	ſ]	[]	[N]	
RECOMMEN	DATI	ons:	(:	If dif	fere	ent f	rom N	ASA)					
	[/]	[)	(]	[DE		ETE)
* CIL RE	TENT	ION	RATIO	ONALE:	(If	app	licab	1	ADEQUATE ADEQUATE]	
REMARKS: REF: RI	/NAS	A CI	L OF	12-23	8-87	AND I	RI/NA		L WORKS	_		F	11-12-

ASSESSMENT DATE: 1/28/88 ASSESSMENT ID: MPS-301X NASA FMEA #: 0410-3													nasa i Basei		[
SUBSYSTE MDAC ID:	M:			MPS 301 LH2		EM	DE	LTA	\ -	P TI	RANSI	ΟÜ	CER (1	1T44)	ı			
LEAD ANA	LYS	T:		w.J	r. MCN	IIC	OLL											
ASSESSME	ASSESSMENT: CRITICALITY REDUNDANCY SCREENS CIL																	
FLIGHT HDW/FUNC A									1C	Y S	CREEI	NS	c			CL CEN	1	
NASA IOA			/1 /1							NA] NA]		[NA] [NA]			[X]	*
COMPARE	[/]	[]		[]		[]		[N]	
RECOMMEN	IDA:	ric	ns:		(If d	iff	ere	ent	1	from	NAS.	A))					
	ĺ		/]	[]		[]		[]	(A		/D		ETE)
* CIL RI	e te i	NT]	ON	RAT	IONAL	E:	(If	f a	ΡĮ	plic			ADEQU NADEQU		[]	
REMARKS: REF: RI	: [/N	AS?	A CI	L O	F 12-	23-	∙87	AN	D	RI/	'NASA	۱	CIL RE	VIEW	M	ΈE	TI	NG

ASSESSMI	ENT DATE: ENT ID: EA #:	MPS-303 0433-1	x		NASA DATA BASELINI NET									
SUBSYSTI MDAC ID: ITEM:		MPS 303 LH2 DEL	ra-p L	INE, .25"	DIA									
LEAD ANA	ALYST:	W.J. MC	NICOLL											
ASSESSME	SSESSMENT:													
CRITICALITY REDUNDANCY SCREENS CIL FLIGHT ITEM HDW/FUNC A B C														
	HDW/FU	С	11011											
NASA IOA	[1 /1 [1 /1] [NA] NA]	[NA] [NA]	[NA] [NA]	[X] * []								
COMPARE	[/] []	[]	[]	[N]								
RECOMMEN	DATIONS:	(If di	fferen	t from NA	ASA)									
	[/	J []	[]		[] .DD/DELETE)								
	TENTION :	RATIONALE	: (If	applicabl	.e) ADEQUATE INADEQUATE	[]								
REMARKS: REF: RI NOTES.	/NASA CI	L OF 12-2	3-87 A	ND RI/NAS	A FMEA/CIL R	EVIEW MEETING								

1100200112111	1/28/88 MPS-304X NA	NASA DATA: BASELINE [] NEW [X]									
MDAC ID:	MPS 304 LH2 HI POINT B	LEED LINE (PV22 TO	PD17)								
LEAD ANALYST:	W.J. MCNICOLL										
ASSESSMENT:		æ									
CRITICALI FLIGHT		ANCY SCREENS	CIL ITEM								
HDW/FU		В С									
NASA [/ IOA [3 /3] []] [NA]	[] [] [NA] [NA]	[] *								
COMPARE [N /N] [N]	[и] [и]	[]								
RECOMMENDATIONS:	(If differen	t from NASA)									
[3 /3] [NA]	[AA] [AA]	[] (ADD/DELETE)								
* CIL RETENTION 1	RATIONALE: (If	ADEQUAT	_								
REMARKS: AN INCREASE IN PIRELIEVED BY THE I	RESSURE CAUSED HI POINT BLEED	INADEQUAT BY THE LOSS OF INSU VALVE RELIEF FEATUR	JLATION WILL BE								

ASSESSMEI ASSESSMEI NASA FME	NT ID:	MPS-305	NASA DATA: BASELINE [] NEW [X]								
SUBSYSTEM MDAC ID:		MPS 305 LH2 HI	POINT B	LEED LINE	(PV22 TO PD	17)					
LEAD ANA	Lyst:	W.J. MC	NICOLL								
ASSESSME	NT:		* *								
(CRITICAL: FLIGH HDW/FU	r	REDUND A	ANCY SCRE	ens C	CIL ITEM					
NASA IOA	[/ /1] [NA]	[] [NA]	[] [NA]	[x] *					
COMPARE	[N /N] [N]	[N]	[N]	[N]					
RECOMMEN	DATIONS:	(If d	ifferen	t from NAS	SA)						
	[1 /1] [NA]	[NA]		[A] DD/DELETE)					
* CIL RE	rention 1	RATIONALI	E: (If	applicable	e) ADEQUATE INADEQUATE	[]					
REMARKS:						. ,					

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	1/29/88 MPS-306X 0457-1	ζ.	NASA DATA: BASELINE [] NEW [X]										
SUBSYSTEM: MDAC ID: ITEM:		E ASSEMBLY	(PD2 TO F	RV7, CV15)									
LEAD ANALYST:	W.J. MC	NICOLL											
ASSESSMENT:													
CRITICAL		REDUNDANCY	SCREENS		CIL ITEM								
FLIGH HDW/FU		A B	'	С									
NASA [1 /1 IOA [1 /1] [NA] [N NA] [N	NA] NA]	[X] *									
COMPARE [/] [] [] [3	[и]								
RECOMMENDATIONS	: (If d	lifferent fi	com NASA)										
[/] [] [] [] (A	[] DD/DELETE)								
* CIL RETENTION	* CIL RETENTION RATIONALE: (If applicable) ADEQUATE [] INADEQUATE []												
REMARKS: REF: RI/NASA C 87.	CIL OF 12	-23-87 AND	RI/NASA (CIL WORKSH	EET OF 9-18-								

ASSESSM	SUBSYSTEM: M							MPS-307X 0405-4							NASA DATA: BASELINE [] NEW [X]					
SUBSYST MDAC ID ITEM:		;		MPS 307 LH2	•	IR	CUL	ATIC	N	DIS	CONN	EC.	r VLAV	E (P	נםי)				
LEAD AN														•						
ASSESSM	ENT	!:													.2					
		F	ICAL LIGH	T		R	EDU	NDAN	CY	SC	REEN	S		_	IL					
		HD	W/FU	NC		A			В			С		ITEM						
NASA IOA	[2 3	/1R /3]]]]	F N2] A]		P NA]	x]	*			
COMPARE	(N	/N]	[N]	[N]	[N]	[N					
RECOMMEN	IDA!	ΓΙC	ons:	()	f d	iff	ere	ent i	fro	om N	IASA)									
			/3		_]	٠			ſ	NA		[ADD/	D DE		TE)			
* CIL RE	TEN	ITI	ON R	ATIO	NALE	E:	(If	app	li	cab	le)									
REMARKS: FAILURE FAILURE	OF OF	TH	E VA	LVE	TO R	EM	AIN	OPE	N	ıs.	IN	ADI	EQUATE EQUATE SED ON	Ì	5-:]] 2.				
	_			- T CV	TOK	чh	JN E	MTT	. بد	HAV.	e no	E	FFECT.							

ASSESSMEN' ASSESSMEN' NASA FMEA	T ID):	1/29/88 MPS-308 0405-7	3 8 X]		SA DATA: ASELINE NEW	[]	
SUBSYSTEM MDAC ID: ITEM:			MPS 308 LH2 RE	CIR	CULAT:	CON	D	isco	ONNE	СТ	VALVE ((PC)3)		
LEAD ANAL	YST:		w.J. M	CNI	COLL										
ASSESSMEN	T:														
c	FI	LIGH'				ANC	ey B	SCR	EENS	c			L EM	Ī	
	HDV	/FU	NC	Æ	A		D			_					
NASA IOA	[3	/3 /3]]	[]	NA] NA]	[[NA NA	.]	[[NA NA]]	[X]	*
COMPARE]				[]	£]	
RECOMMENI	OATI	ons:	(If	di :	fferen	t i	fro	om N	ASA)	l					
	[/	1	[1	[]	[] (A		/ DI		ETE)
* CIL RET	rent	ION	RATION	\LE	: (If	ap)	pl:	icab			EQUATE EQUATE]	
REMARKS: THE RI/NA OF THE VA INDICATOR		m 🔿	CIACE '	rc	COVFPF	en e	ON	()4(ם – כו	•	LATPORE	, ,	1	T 11.	

ASSESSME	ENT ID: EA #:	MPS-309X	C			DATA: ELINE (NEW (x]
SUBSYSTE MDAC ID:		MPS 309 LH2 RECI	RCULA	TION DIS	CONNECT V	ALVE (PD	3)
LEAD ANA	LYST:	W.J. MCN	ICOLL				
ASSESSME	NT:						
	CRITICAL FLIGH HDW/FU	T	REDUN A	DANCY SC	REENS C	CI	
NASA IOA	, .] [NA] NA]		[NA] [NA]	[] *]
COMPARE	[/] []	[]	[]	[]
RECOMMEN	DATIONS:	(If di	ffere	nt from	NASA)		
	[/] []	[]	[]	[(ADD/I] DELETE
REMARKS:		RATIONALE			ADEQU INADEQU]

ASSESSME ASSESSME NASA FME	NT ID:	MPS-310							NASA DA BASELI N					
SUBSYSTE MDAC ID:		MPS 310 LH2 REC	CIRC	TAIU	NOI	D	isco	NNE	CT VALV	Æ (PD	3)		
LEAD ANA	LYST:	W.J. MC	CNIC	COLL										
ASSESSME	NT:			, Ž.										
	CRITICAL FLIGH	T	RI A	EDUNE		Y B	SCRE		С		CI IT	L EM	[
	HDW/F	JNC	A		1	D			C					
NASA IOA	[2 /1]	R] R]	[P [P]	[F F]	[P] P]		[X]	*
COMPARE	[/]	[]	[]	[)		[N]	
RECOMMEN	DATIONS	: (If o	dif:	ferer	nt f	ro	m NA	SA)						
	[/	1	[]	[]	[]	(AD		DE		ETE)
* CIL RE	TENTION	RATIONA	LE:	(If	app	li	cabl		ADEQUA'		[]	
REMARKS: REF: RI 87.	/NASA C	IL OF 12	-23·	-87 <i>1</i>	AND	RI	/NAS	SA C	IL WOR	KSHE	ΕΊ	: C)F	11-11

ASSESSME ASSESSME NASA FME	ENT	ID:	MPS- NA					N	IASA BASE		[]	
SUBSYSTE MDAC ID:			MPS 311 LH2	RECIF	CUL#	ATION	DISC	ONNEC	T VA	LVE	(Pi	D3))	
LEAD ANA	LYS	T:	W.J.	MCNI	COLI									
ASSESSME	ENT:		£	:										
		TICAL FLIGH	IT	F		IDANC	Y SCR B	REENS	!			IL FEN	4	
NASA IOA	[1 /1 1 /1]	[N [N	IA] IA]	[]	NA] NA]	[N	A] A]		[x]	*
COMPARE	[/]	[]	[]	[3		[N)	
RECOMMEN	IDAT	IONS:	(1	f dif	fere	ent fi	rom N	IASA)						
	[/]	[]	[]	[]	(A		/DE		ETE)
* CIL RE REMARKS: REF: RI					·		licab	À	DEQU DEQU]	

ASSESSME ASSESSME NASA FME	NT I	D:		·312X					ASA D BASEL	INE	x]]
SUBSYSTE MDAC ID: ITEM:			MPS 312 LH2	RECIRC	:ULA	rion	PUMP	VALV	E (PV	14,	15,	16)
LEAD ANA	LYST	r:	W.J	MCNIC	OLL							
ASSESSME	NT:											
	1	TICAL FLIGH DW/FU	T	RE A	EDUN	D AN CY E		EENS C	!		CIL	м
NASA IOA		3 /3 3 /3		[N2 [N2	A] A]	[N	IA] IA]	[N []	IA] IA]		[] *
COMPARE	[/]	ſ)	[]	[]		(]
RECOMMEN	TADI	ions:	(If dif	fere	nt fi	com N	(ASA				
	[/]	[]	[]	[)	(A	[DD/D] ELETE)
* CIL R	ETEN	TION	RATI	ONALE:	(If	app.	licab	1	ADEQU <i>I</i> ADEQU <i>I</i>		[]
REMARKS	:											

REF: RI/NASA FMEA/CIL REVIEW MEETING NOTES.

ASSESSMENT ID: NASA FMEA #:			NASA DATA BASELINE NEW	
MDAC ID:	MPS 313 LH2 RECIRCULAT	TION PUMP	VALVE (PV14,	15, 16)
LEAD ANALYST:	W.J. MCNICOLL			
ASSESSMENT:				
FLIGHT		ANCY SCRE	ens	CIL ITEM
HDW/FUN	IC A	В	С	<u></u>
NASA [1 /1 IOA [/] [NA]] []	[NA] []	[NA] []	[X] *
COMPARE [N /N] [N]	[N]	[N]	[N]
RECOMMENDATIONS:	(If differen	t from NAS	SA)	
[/] []	[]	[] (AI	[] DD/DELETE;
* CIL RETENTION R	ATIONALE: (If	applicable	-	
REMARKS:			ADEQUATE INADEQUATE	[D]
FAILURE MODE IS N THIS FMEA/CIL SHO REF: RI/NASA CIL	OTO RE DEOLDED	IN THE RI/	NASA CIL OF	12-23-87.

ASSESSMENT DA ASSESSMENT II NASA FMEA #:		314X		NASA DAT BASELIN NE		
SUBSYSTEM: MDAC ID: ITEM:	MPS 314 LH2	RECIRCULA	TION PUMP	VALVE (PV14	, 15,	16)
LEAD ANALYST:	w.J.	MCNICOLL				
ASSESSMENT:						
	CALITY LIGHT	REDUN	DANCY SCR	EENS	CIL	
	V/FUNC	A	В	С		
NASA [2 IOA [2	/1R] /1R]	[P] [P]	[F] [F]	[P] [P]	[X [] *]
COMPARE [/]	[]	[]	[]	[N]
RECOMMENDATIO	ons: (I	f differe	nt from N	IASA)		
ľ	/ 1	[]	[]	[]	[D\DDA] ELETE)
* CIL RETENT	ION RATIO	NALE: (If	applicab	ole) ADEQUATE INADEQUATE]
REMARKS: REF: RI/NASA	A CIL OF	12-23-87.				

SUBSYSTEM: MDAC ID:	MPS-315X 0404-3 MPS 315	NASA DA BASELI N ON PUMP (PP1, 2, 3	NE [] IEW [X]
LEAD ANALYST:	W.J. MCNICOLL		
ASSESSMENT:		•	
CRITICALI FLIGHT HDW/FUN	ľ	NCY SCREENS B C	CIL ITEM
NASA [3 /3 IOA [3 /3] [NA]] [NA]	[NA] [NA] [NA]	[] *
COMPARE [/] []	[] []	[]
RECOMMENDATIONS:	(If different	from NASA)	
1] []	[] []	[] (ADD/DELETE)
* CIL RETENTION F REMARKS: REF: RI/NASA FM	RATIONALE: (If a EA/CIL REVIEW ME	ADEQUAT INADEQUAT	

ASSESSME ASSESSME NASA FME	NT	ID):	MP	29/88 5-316X 05-2						٠	NASA DATA BASELINE NEW]
SUBSYSTE MDAC ID: ITEM: 22, 23)				MP: 31 GH:	6	su	RIZ?	ATIC	n :	ISOLA'	ΓI	ON CHECK	VAL	VE	(CV21
LEAD ANA	LYS	ST	:	W.,	J. MCN	IIC	COLL								
ASSESSMI	ENT	:													
		F	ICAL LIGH W/FU	T		RE A	EDUN	DANG	CY B	SCREE	NS	c	CI II	L	I
NASA IOA	[2	•	.]]	P NA] A]	[NA NA]	[F] NA]	[x] *
COMPARE	[N	/N]	[N]	[1	[N]	[N]
RECOMME	NDA	TI	ons:		(If d	if:	fere	nt	fro	m NAS	A))			
	(3	/3]	[N	A]	[NA	.]	[NA]		D / D1] ELETE)
* CIL R	ETE	NT	ION	RAT	TIONAL	E:	(If	ap	pli	.cable		ADEQUATE NADEQUATE]
REMARKS	:													_	

THE RI/NASA ANALYSIS ADDRESSES ABORT ONLY. FAILURE OF BOTH SERIES REDUNDANT CHECK VALVES ON A SHUTDOWN ENGINE (ABORT) AS WELL AS ANOTHER FAILURE (i.e., MFV FAILS TO CLOSE/REMAIN CLOSED) WILL ALLOW ULLAGE PRESSURE TO BE LOST. ABORT CRITICALITY SHOULD BE 3/1R.

ASSESSMI ASSESSMI NASA FMI	ENT :	ID:	1/29 MPS- 0505	317X					NASA DAT BASELIN NE		x]	
SUBSYSTEMDAC ID: ITEM: 22, 23)			MPS 317 GH2	PRES	SURIZ	ATIO	N ISC	LATI	ои снеск	VAL	VE (CV2	!1,
LEAD ANA	LYSI	?:	W.J.	MCN	ICOLI	ı						
ASSESSME	ENT:											
	F	ICAL LIGH W/FU	T		REDUN A	DANC)			2	CII	_	
NASA IOA	[3	/3]	[]	NA] NA]	[N	IA] IA]	-	NA] NA]	[] *]	
COMPARE	[/]	[]	[]	[]	(]	
RECOMMEN	DATI	ons:	(I	f di	ffere	nt fr	om N	ASA)				
	[/]	[]	[]	[] (2	[\DD/[] ELETE)	
* CIL RE								INA	DEQUATE	[]	
REF: RI	/NAS	A FM	EA/CII	L RE	IEW I	MEETI	NG N	OTES.				

ASSESSME ASSESSME NASA FME	NT	II):	MPS.	-318X	•							SA DATA ASELINE NEW	[]		
SUBSYSTE MDAC ID: ITEM: 58)				MPS 318 GH2	PRES	st	JRI:	ZATIO	N	FLO	W CC	TN(ROL VAL	VE	(L	. V5	6,	57,
LEAD ANA	ALY	ST	:	W.J	. MCN	II	COL	L										
ASSESSMI	ENI	:																
	CF			ITY		RI	EDU	NDAN	CY	SCR	EENS	5		C]	L EM	ſ		
			LIGH W/FU			A			В			С						
NASA IOA	!	[2 [2	/1R /1R]	[F F]	[P P]	[P F]	[[X]	*	
COMPARE	1	[/]	[}	ι		1	[N]	[N]		
RECOMME	ND	ATI	ons:	(If d	if	fer	ent	fr	om N	ASA)						
		[2	/1F	2]	[F]	[P]	[F] (2	DD.	/ DI		ETE)
* CIL R	ET:	ENT	OION	RAT]	ONAL	E:	(1	[f ap	pl	icab			DEQUATE DEQUATE	_]		
REMARKS REF: R NOTES.	: !!/	NAS	A C	L OI	7 12 -	23	-87	7 AND	R	I/NA	ASA	FM	EA/CIL 1	REV	ΙE	W N	1EE	TING

	2/01/88 MPS-319X 0407-5		NASA DATA BASELINE NEW	
MDAC ID:	MPS 319 LH2 FEED DI	SCONNECT VAL	VE (PD2)	
LEAD ANALYST:	W.J. MCNICO	OLL		
ASSESSMENT:				
CRITICALI FLIGHT		DUNDANCY SCREI	ens	CIL ITEM
HDW/FUN	IC A	В	С	1 LUI
NASA [1 /1 IOA [1 /1] [NA]	[NA] [NA]	[NA] [NA]	[X] * []
COMPARE [/] []	[]	[]	[N]
RECOMMENDATIONS:	(If diffe	rent from NAS	SA)	
1] []	[]	[] (A	[] DD/DELETE)
* CIL RETENTION R	ATIONALE: (If applicable	ADEQUATE INADEQUATE	[]
REMARKS: REF: RI/NASA CIL 87.	OF 12-23-8	7 AND RI/NASA	CIL WORKSHI	EET OF 12-15-

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	MPS-320X	ζ		BASELINE NEW	
MDAC ID:	MPS 320 LH2 FEEL	D DISCON	NECT VALV	/E (PD2)	
LEAD ANALYST:	W.J. MCN	NICOLL			
ASSESSMENT:					
CRITICAL		REDUNDAL	NCY SCREI	ens	CIL ITEM
FLIGH HDW/FU		A	В	С	11011
NASA [2 /1R IOA [2 /1R] [P] P]	[F] [F]	[P] [P]	[X] * []
COMPARE [/] []	[]	[]	[N]
RECOMMENDATIONS:	(If d	ifferent	from NAS	SA)	
[/] []	[]	[] (2	[] ADD/DELETE)
* CIL RETENTION	RATIONAL	E: (If a	pplicablo	e) ADEQUATE INADEQUATE	
REMARKS: REF: RI/NASA CI 87.	L OF 12-	23-87 AN	D RI/NAS	A CIL WORKSH	HEET OF 12-15

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	MPS-321X	NASA DATA BASELINE NEW						
MDAC ID:	MPS 321 LH2 FEED DISCONNE	ECT VALVE (PD2)						
LEAD ANALYST: W.J. MCNICOLL								
ASSESSMENT:								
FLIGH!		CY SCREENS B C	CIL ITEM					
NASA [1 /1 IOA [2 /1R] [NA] [] [P] [NA] [NA] F] [F]	[X] *					
COMPARE [N /N] [N][и] [и]	[N]					
RECOMMENDATIONS:	(If different f	from NASA)						
[2 /1R] [P] [F] [F] (A	[] DD/DELETE)					
* CIL RETENTION I	RATIONALE: (If app							
		ADEQUATE INADEQUATE	[]					
CLOSE IS SECONDAI	FAILURE OF THE VALVE TO CLOSE IS ADDRESSED ON 0407-6. FAILURE TO CLOSE IS SECONDARY TO THE FAILURE OF THE POSITION INDICATOR. REF: RI/NASA CIL OF 12-23-87 AND RI/NASA CIL WORKSHEET OF 12-15-							

ASSESSMENT ASSESSMENT NASA FMEA	r ID:	MPS-3222	‹		NASA DATA: BASELINE NEW	
SUBSYSTEM MDAC ID: ITEM:	:	MPS 322 LH2 FEE	D DISCONN	ECT VALVE	(PD2)	
LEAD ANAL	YST:	W.J. MC	NICOLL			
ASSESSMEN	T:					
C	RITICAL		REDUNDAN	CY SCREEN	1S	CIL ITEM
	FLIGH HDW/FU		A	В	С	
NASA IOA	[1 /1 [1 /1] [NA] [NA]		[NA] [NA]	[X] * []
COMPARE	[/] [] []	[]	[N]
RECOMMENI	DATIONS:	(If d	lifferent	from NAS	A)	
	[/	j f]	[]	[]	[] ADD/DELETE)
* CIL RE	TENTION	RATIONA	LE: (If a	pplicable	ADEQUATE INADEQUATE	[]
REMARKS: REF: RI 87.	/NASA C	IL OF 12	-23-87 AN	D RI/NASA	CIL WORKS	HEET OF 12-15-

ASSESSME ASSESSME NASA FME	NT DAT: NT ID: A #:	E: 2/0: MPS- 0804	1/88 -323X 4-1						DATA ELINE NEW	[]	
SUBSYSTE MDAC ID: ITEM:		MPS 323 LH2	FEED	DISC	CONNEC	CT V	ALVE	(PD2)	1				
LEAD ANA	LYST:	₩.J.	MCN	ICOLI	<u>.</u>								
ASSESSME	NT:												
•	CRITICA FLIC	LITY	1	REDUN	DANCY	scr	REENS				[L		
	HDW/F	TUNC	2	A	E	3	(2		1.1	PEM		
NASA IOA	[/1	.R]	[]	[]	[[]		[X] *]	
COMPARE]	[]]	[J			N]		
RECOMMENI	DATIONS	: (I	f dif	fere	nt fr	om N	ASA)						
		1			[]	(AI		D] DEI		E)
* CIL RET	ENTION	RATIO	NALE:	(If	appl	icab							
REMARKS:							INA		ATE	-]		
THIS FAIL INDICATIO REF: RI/	- (040	, J, M	ID ER	RUNE	ADDI DUS II	RESSI NDIC	ED UN ATION	DER] (040	Loss 07-10	OF).	PO	SII	NOI:

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	MPS-324X	MPS-324X BASELINE (0402-7 NEW						
MDAC ID:	MPS 324 LH2 PREVAI	LVE (PV4, 5, 6)						
LEAD ANALYST:	W.J. MCNIC	COLL						
ASSESSMENT:								
CRITICAL FLIGH		EDUNDANCY SCREENS		CIL ITEM				
	NC A	В	С					
NASA [1 /1 IOA [2 /1R] [NA] [P	A] [NA] [] [F] [NA] F]	[X] * []				
COMPARE [N /N] [N] [N] [N]	[N]				
RECOMMENDATIONS:	(If diff	ferent from NASA)						
[2 /1R] [P] [F] [F] (AI	[] DD/DELETE)				
* CIL RETENTION	RATIONALE:		ADEQUATE IADEQUATE					
REMARKS: VALVE FAILURE TO OPEN IS ADDRESSED ON 0402-5. FAILURE OF THE VALVE AND FAILURE OF THE INDICATOR ARE BOTH REQUIRED TO CAUSE A LOSS OF CREW OR VEHICLE. REF: RI/NASA CIL OF 12-23-87 AND RI/NASA CIL WORKSHEET OF 12-15- 87.								

ASSESSMI ASSESSMI NASA FMI	ENT 1	D:		325X				1	NASA DA BASELI N			
SUBSYSTEMDAC ID:			MPS 325 LH2	PREVA	LVE ((PV4,	5,	6)				
LEAD ANA	LYSI	r:	W.J.	MCNI	COLL							
ASSESSME	ENT:											
		TICAL TLIGH		R	EDUNI	DANCY	SCR	EENS		CI	L	
	HI	W/FU	NC	A	<u>.</u>	E	3	(2			
NASA IOA	[1 [1	/1]	[N [N	A] A]	[N [N	IA] IA]	1] 1]	IA] IA]]	х ј	*
COMPARE	[/]	[3	[]	[1	[и ј	
RECOMMEN	IDATI	ons:	(I	f dif	ferer	nt fr	om N	ASA)				
	[/]	[]	ſ]	[]	[(ADD/	DEL.	ETE)
* CIL RE	ETENT	NOI	RATIO	NALE:	(If	appl	icab	P	ADEQUAT:]	
REMARKS: REF: RI		A CI	L OF	12-23	-87 A	ND F	RI/NA		~		OF	12-15-

ASSESSMEN ASSESSMEN NASA FMEA	T ID):	2/01, MPS-3 0802	326X					BASEI	ATA: LINE NEW	[_		
SUBSYSTEM MDAC ID: ITEM:			MPS 326 LH2	PREVA	LVE	(PV4,	5,	6)						
LEAD ANA	LYST:	:	w.J.	MCNI	COLL									
ASSESSME	T:													
•		CALI		F	EDUN	DANCY	SC	REENS			CIL			
			NC	A		В		С						
NASA IOA	[/1R /]	[[]	[]	[]		[X]	*	
COMPARE	[/N]	[]	[]	[]		[N]		
RECOMMEN	DATI	ons:	(I	f di	fere	nt fr	om	NASA)						
	[/]	[]	[]	[1	(A)]]\do		ETE)	
* CIL RE	TENT	ION	RATIC	NALE	: (If	appl	ica	А	DEQU DEQU	ATE ATE	[]		
REMARKS: THIS FAI INDICATI ANALYSIS REF: RI	LURE ON (0402 ULD	-6) A BE DI	AND E	RRONI D.	EOUS 1	DRE NDI	ESSED U	NDER	LOS:	s 01).	TH	POSIT	NOI!

	2/01/88 MPS-327X 0434-1		NASA DATA BASELINE NEW	
SUBSYSTEM: MDAC ID: ITEM:	MPS 327 LH2 FEEDLINE SO	CREEN		
LEAD ANALYST:	W.J. MCNICOLL			
ASSESSMENT:				
CRITICALI FLIGHT		NCY SCREEN	s	CIL ITEM
HDW/FUN	IC A	В	С	- 1 DI
NASA [1 /1 IOA [1 /1] [NA]] [NA]	[NA] [NA]	NA] NA]	[X] * []
COMPARE [/] []	[] []	[N]
RECOMMENDATIONS:	(If different	from NASA))	
[/] []] []	-	[] DD/DELETE)
* CIL RETENTION R	ATIONALE: (If a	•	ADEQUATE NADEQUATE	[]
REMARKS: REF: RI/NASA CIL 87.	OF 12-23-87 AN			- ,

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	MPS-328X		NASA DATA: BASELINE [] NEW [X]				
5050151	MPS 328 LH2 FEEDLIN	NE SCREEN					
LEAD ANALYST:	W.J. MCNICO	OLL					
ASSESSMENT:							
CRITICAL		DUNDANCY SCREE	NS	CIL ITEM			
FLIGH HDW/FU		В	С	TILM			
NASA [1 /1 IOA [1 /1] [NA] [NA] [NA]] [NA]	[NA] [NA]	[x] *			
COMPARE [/] [] []	[]	[N]			
RECOMMENDATIONS:	(If diff	erent from NAS	A)				
[/] [] []	[] (A)	[] DD/DELETE)			
* CIL RETENTION	RATIONALE:) ADEQUATE INADEQUATE	[]			
REMARKS: REF: RI/NASA CI	L OF 12-23-	87 AND RI/NASA					

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	2/01/88 MPS-3293 0437-5	x		NASA DAT BASELIN NE	
SUBSYSTEM: MDAC ID: ITEM:	MPS 329 LH2 FEE	DLINE R	ELIEF SH	JTOFF VALVE	(PV8)
LEAD ANALYST:	W.J. MC	NICOLL			
ASSESSMENT:					
CRITICAL FLIGH HDW/FU	r	REDUND	ANCY SCRI		CIL ITEM
nDw/ru	NC	A	В	С	
NASA [2 /1R IOA [3 /1R] [P] P]	[F] [F]	[P] [P]	[X] *
COMPARE [N /] [1	[]	[]	[N]
RECOMMENDATIONS:	(If di	ifferen	t from NA	ASA)	
[3 /1R] [P]	[F]	[P]	[] ADD/DELETE)
* CIL RETENTION REMARKS:	RATIONALE	E: (If	applicabl	.e) ADEQUATE INADEQUATE	
FAILURE OF THE VA	ALVE TO F	REMAIN	CLOSED IS	ADDRESSED	ON 0437-5.

FAILURE OF THE INDICATOR, THE VALVE AND THE RELIEF VALVE ARE ALL REQUIRED BEFORE A LOSS OF CREW OR VEHICLE IS POSSIBLE. REF: RI/NASA CIL OF 12-23-87 AND RI/NASA CIL WORKSHEET OF 10-5-

87.

ASSESSME ASSESSME NASA FME	NT	ID:		-330X						•			
SUBSYSTE MDAC ID:	M:		MPS 330 LH2		INE	RELI	EF SH	UTOF	F VAL	VE (PV8)		
LEAD ANA	LYS	T:	W.J	. MCNI	COLL)							
ASSESSME	NT:												
		TICAL FLIGH		F	EDUN	DANC	Y SCR	EENS			CIL	-	
	Н	DW/FU	NC	7			В	(С				
NASA IOA		3 /3 3 /3]	[N	IA] IA]	[NA] NA]	[] []	NA] NA]		[[] *	
COMPARE	[/]	[]	[)	[]		[]	
RECOMMEN	DAT	'IONS:	(If di	fere	nt f	rom N	ASA)					
	[/]	[]	[]	[3	(A	[DD/E] ELETE	:)
* CIL RE	TEN	TION	RATI	ONALE:	(If	app	licab		ADEQU ADEQU]]	
REF: RI	/NA	SA FM	EA/C	IL REV	/IEW	MEET	ING N	OTES	•				

ASSESSMENT ID: NASA FMEA #:	MPS-331X	1	BASELINE NEW	
MDAC ID:	MPS 331 LH2 FEEDLINE R	ELIEF SHUTOF	F VALVE (I	PV8)
LEAD ANALYST:	W.J. MCNICOLL			
ASSESSMENT:				
CRITICAL FLIGH HDW/FU	T	ANCY SCREENS B	c	CIL ITEM
NASA [1 /1 IOA [1 /1] [NA]] [NA]	[NA] [1 [NA] [1	NA] NA]	[X] * []
COMPARE [/] []	[] []	[N]
RECOMMENDATIONS:	(If different	t from NASA)		
[/] []	[] [] (AD	[] DD/DELETE)
* CIL RETENTION REMARKS:	RATIONALE: (If a	1	ADEQUATE ADEQUATE	
	L OF 12-23-87 A	ND RI/NASA C	IL OF 10-5	i−87.

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	MPS-332X		NASA DATA: BASELINE NEW						
SUBSYSTEM: MDAC ID: ITEM:	MPS 332 LH2 FEEDLI	32 H2 FEEDLINE RELIEF FLAME ARRESTOR (FL1)							
LEAD ANALYST: W.J. MCNICOLL									
ASSESSMENT:									
CRITICA		DUNDANCY SCREEN	S	CIL ITEM					
FLIGI HDW/F		В	С						
NASA [3 /3 IOA [3 /3] [NA] [NA	A] [NA] [A] [NA] [NA] NA]	[X] *					
COMPARE [/] [] [] []	[]					
RECOMMENDATIONS	: (If diff	ferent from NASA	A)						
			1	[] ADD/DELETE)					
* CIL RETENTION	RATIONALE:	(If applicable) ADEQUATE INADEQUATE	[]					
REMARKS: THE RI/NASA ANALYSIS INDICATES A 1/1 CRITICALITY FOR ABORT. REF: RI/NASA CIL OF 12-23-87 AND RI/NASA CIL WORKSHEET OF 8-21-87.									

ASSESSM	ASSESSMENT DATE: 2/02/88 ASSESSMENT ID: MPS-333X NASA FMEA #: 0435-4							NASA DATA: BASELINE [] NEW [X]						
SUBSYST MDAC ID ITEM:				MPS 333 LH2 FEE	EDLIN	VE REI	LIEF	FLAME	ARRES	TOR	(FL	1)		
LEAD AN	ALY	ST:										·		
ASSESSMI	ENT:	:												
	CR		CALI'	ΓY	RED	UNDAN	ICY S	CREEN	S		CII			
	F	HDW/	/FUN	C	A		В		С		ITI	ΞM		
NASA IOA	•	1 /	′1 ′1		NA] NA]		NA] NA]	_	NA] NA]		[}	(]	*	
COMPARE	[/	']] []	[1	[]		[]	ן ז		
RECOMMEN	DAT	'ION	s:	(If d	iffe	rent	from	NASA)						
	[]	_	J	[]	ľ.]	(AD	[D/D		ETE)	
* CIL RE	TEN	TIO	N RA	TIONALI	Ξ: (If app	plica	ble)						
REMARKS: REF: RI	/NA:	SA (CIL	OF 12-2	23-87	חאג ז	DT /M	IN	ADEQUA ADEQUA	TE	[[]		
07						TALL		DOW C	IL WOR	KSHE	ET (α F	8-22-	

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	MPS-334X	NASA DA BASELI N	TA: NE [] EW [X]
MDAC ID:	MPS 334 LH2 FEED RTLS	INBOARD VALVE (PV17)
LEAD ANALYST:	W.J. MCNICOLL		
ASSESSMENT:			
CRITICAL		ANCY SCREENS	CIL ITEM
FLIGHT HDW/FUI	r NC A	в с	TIEM
NASA [3 /3 IOA [1 /1] [NA]] [NA]	[NA] [NA] [NA] [NA]	[X] * [X]
COMPARE [N /N] []	[] []	[N]
RECOMMENDATIONS:	(If differer	nt from NASA)	
[1 /1] [NA]	[NA] [NA]	[A] (ADD/DELETE)
* CIL RETENTION I	RATIONALE: (If		
		ADEQUAT INADEQUAT	
		A 1/1 CRITICALITY F	

REF: RI/NASA OF 12-23-87 AND RI/NASA FMEA/CIL REVIEW MEETING

NOTES.

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	MPS-335X			NASA DATA BASELINE NEW]
	MPS 335 LH2 FEED	RTLS INB	OARD VAL	VE (PV17)		
LEAD ANALYST:	W.J. MCNI	COLL				
ASSESSMENT:						
CRITICAL: FLIGHT	CIL					
	NC A		В	С		-
NASA [3 /3 IOA [3 /3] [NA	A] [:	NA] [NA] [NA] NA]	[X] *
COMPARE [/] [] [] [1	[]
RECOMMENDATIONS:	(If dif	ferent f	rom NASA)		
[3 /3] [N	A] [:	NA] [[DD/DE] ELETE)
* CIL RETENTION I	RATIONALE:	(If app	•		_	
2002			I	ADEQUATE NADEQUATE	[]
REMARKS: THE RI/NASA ANALY IOA BELIEVES A 3/ REF: RI/NASA OF NOTES.	/3 APPLIES	•				

ASSESSME ASSESSME NASA FME	TN	ID		2/02, MPS-1 0651	336X								SA DATA: ASELINE NEW	[) 	
SUBSYSTEM: MPS MDAC ID: 336 ITEM: LH2 FEED RTLS INBOARD VALVE							(PV17)										
LEAD ANALYST: W.J. MCNICOLL																	
ASSESSME	NT:																
	CR1		CAL			RE	DUNI	OANC	CY	SCRE	EEN	S		CI	L EM		
	I		JIGHT I/FUI			A			В			С					
NASA IOA	[2	/1R /3]	[P NA]	[F NA]	[F N] A]	[X]	*
COMPARE	[N	/N]	[N]	ſ	N]	[N	1	[N]	
RECOMME	NDA'	TI	ons:	(3	[f d	if1	fere	nt	fro	om N.	ASA	.)					
	[3	/3]	[N?	A]	[NZ	A]	[N	A] (A		D / DE		ETE)
* CIL R	ETE	NT	ION	RATI(ONAL	E:	(If	ap	pl	icab		-	DEQUATE]	
DEMIDEC																_	

FAILURE OF THE VALVE TO CLOSE IS ADDRESSED ON 0651-4. FAILURE OF THE INDICATOR ALONE WILL HAVE NO EFFECT OTHER THAN A POSSIBLE

LAUNCH SCRUB. REF: RI/NASA OF 12-23-87 AND RI/NASA FMEA/CIL REVIEW MEETING NOTES.

ASSESSMENT ASSESSMENT NASA FMEA #	ID: MPS	-337X	NASA DATA: BASELINE [] NEW [X]								
SUBSYSTEM: MDAC ID: ITEM:	MPS 337 LH2	FEED RTLS	INBOARD	VALVE (PV1	7)						
LEAD ANALYS	T: W.J	. MCNICOLL									
ASSESSMENT:											
1	TICALITY FLIGHT DW/FUNC	REDUNI A	DANCY SCR B	EENS C	CII ITE	_					
NASA [:	3 /3] 3 /3]	[NA] [NA]	[NA] [NA]	[NA]	[] *					
COMPARE [/ 1	[]	[]	[]	C]					
RECOMMENDATI	IONS: (I	f differer	nt from N	ASA)							
(/]	[]	[]	[]	[(ADD/D] ELETE)					
* CIL RETENT REMARKS: REF: RI/NAS		NALE: (If L REVIEW M		ADEQUAT INADEQUAT]					

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	2/02/88 MPS-338X 0651-7	C			: [x]
SUBSYSTEM: MDAC ID: ITEM:	MPS 338 LH2 FEEI	RTLS O	UTBOARD V	ALVE (PV18)	
LEAD ANALYST:	W.J. MCN	NICOLL			
ASSESSMENT:					
CRITICAL	CIL ITEM				
FLIGH HDW/FU		A	В	С	
NASA [2 /1R IOA [3 /3] [P] NA]	[F] [NA]	[F] [NA]	[X] *
COMPARE [N /N] [N]	[N]	[N]	[и]
RECOMMENDATIONS:	(If d	ifferent	from NAS	SA)	
[3 /3] [NA]	[NA]	[NA] (A	[D] .DD/DELETE)
* CIL RETENTION	RATIONAL	E: (If a	applicable	e) ADEQUATE INADEQUATE	[]
REMARKS: FAILURE OF THE V	ALVE TO	CLOSE IS	ADDRESS	ED ON 0651-4	. FAILURE (

THE INDICATOR ALONE WILL HAVE NO EFFECT OTHER THAN A POSSIBLE

REF: RI/NASA CIL OF 12-23-87 AND RI/NASA FMEA/CIL REVIEW MEETING

LAUNCH SCRUB.

NOTES.

ASSESSME ASSESSME NASA FME	NT :	ID:		339X		NASA DATA: BASELINE [] NEW [X]							
SUBSYSTE MDAC ID:			MPS 339 LH2	FEED	RTLS	OUT	BOARD	VAL	VE (P	V18)			
LEAD ANA	LYST	r:	W.J.	MCNI	COLI								
ASSESSME	NT:												
	1	FICAL FLIGH DW/FU		R			Y SCR		C		CII	-	
NASA IOA	[3	3 /3]	[N	A] A]	[]	NA] NA]	[]	NA] NA]		[]	*
COMPARE	[/]	[]	[]	[1		[]	
RECOMMEN	DATI	cons:	(I	f dif	fere	nt fi	com N.	ASA)					
	[/]	C]	[]	[]	(A)	[DD/E] DELE	TE)
* CIL RE REMARKS: REF: RI				NALE: L REV				INZ	ADEQUA ADEQUA		[]	

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	2/02/88 MPS-340X 0423-1	NASA DATA: BASELINE NEW	
SUBSYSTEM: MDAC ID: ITEM:	MPS 340 LH2 RELIEF LINE	(FROM PV8 TO RV6)	
LEAD ANALYST:	W.J. MCNICOLL		
ASSESSMENT:			
CRITICAL: FLIGH	ITY REDUNDAN	CY SCREENS	CIL ITEM
HDW/FU		ВС	
NASA [1 /1 IOA [1 /1] [NA] [] [NA] [NA] [NA] NA] [NA]	[X] * []
COMPARE [/] [] [] []	[и]
RECOMMENDATIONS:	(If different	from NASA)	
[/] [][] [] (A	[] DD/DELETE)
* CIL RETENTION	RATIONALE: (If ap	plicable) ADEQUATE INADEQUATE	[]
REMARKS: REF: RI/NASA CI 87.	L OF 12-23-87 AND	RI/NASA CIL WORKSH	EET OF 8-23-

ASSESSM ASSESSM NASA FM	ENT :	ID:	2/0: MPS: 046:	-341X					NASA DATA BASELINI NEV		x]	
SUBSYST			MPS 341 LH2	RELIE	F L	INE (RV6 I	O FL	1)			
LEAD AN	ALYS	r:	W.J	. MCNI	COLI							
ASSESSM	ENT:											
	1	FLIGH	ITY IT INC		EDUN		Y SCR		с	CI		
NASA		•			' A 1	r	NA 1		_			.
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REMARKS: REF: RI		SA CI	L OF	12-23	-87	AND :	RI/NA	SA C	IL WORKSH	EET	OF 8	3-23-

ASSESSMI ASSESSMI NASA FMI	ENT I	D:	MPS-	-342X					NASA DAT BASELIN NE			
SUBSYSTI MDAC ID: ITEM:			MPS 342 LH2	RELIE	F SEN	ISE 1	LINE					
LEAD ANA	ALYST	:	W.J.	MCNI	COLL							
ASSESSMI	ENT:											
	F	LIGH	_				Y SCR	EENS		CI	L EM	
	HD	W/FU	NC	A		1	В		С			
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COMPARE	[/	3	ſ]	[]	[]	[n j	
RECOMMEN	ITAGN	ons:	(1	f dif	ferer	nt fi	com N	ASA)				
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* CIL RI		ION	RATIC	NALE:	(If	app]	licab	-	ADEQUATE IADEQUATE] []	
REMARKS:	-	A CI	L OF	12-23	-87 <i>P</i>	ND I	RI/NA	SA C	IL WORKS	HEET	OF	8-23-

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	2/02/88 MPS-343X 0462-2		NASA DATA: BASELINE NEW	
MDAC ID:	MPS 343 LH2 RELIEF SENS	E LINE		
LEAD ANALYST:	W.J. MCNICOLL			
ASSESSMENT:				
CRITICAL: FLIGHT		NCY SCREENS	5	CIL ITEM
HDW/FUI		В	С	
NASA [1 /1 IOA [1 /1] [NA]] [NA]	[NA] [NA]	NA] NA]	[X] * []
COMPARE [/] []	[] []	[и]
RECOMMENDATIONS:	(If different	from NASA)	
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* CIL RETENTION	RATIONALE: (If a		ADEQUATE NADEQUATE	
REMARKS: REF: RI/NASA CI: 87.	L OF 12-23-87 AN		-	

ASSESSME	SMENT DATE: 2/02/88 NASA DATA: SMENT ID: MPS-344X BASELINE [] FMEA #: 0506-1 NEW [X]													
SUBSYSTE MDAC ID: ITEM: CV22 TO			MPS 344 GH2 P 23 TO			TION	SUP	PLY I	LINE (CV21	. Т	0	LV5	6,
LEAD ANA	LYST	:	W.J.	MCN1	COLL									
ASSESSME	NT:													
CMITTOMETT MEDITION DOLLARS									CIL ITEM					
		•				_								
NASA IOA	[1	/1 /1]	[]	IA] IA]	[N	A] A]	[]	NA] NA]		[X] *	
COMPARE	[/]	[]	[]	[]		[N]	
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* CIL RE	TENT	ION	RATION	IALE:	: (If	app]	icab		ADEQUA ADEQUA]	
REMARKS: REF: RI NOTES.		A CI	L OF 1	.2-23	3-87 <i>i</i>	AND F	RI/NA	SA F	MEA/CI	L R	EVI	ΕV	ME	ETING

ASSESSME ASSESSME NASA FME	NT I	D:	MPS-	345X		1	NASA DATA: BASELINE [] NEW [X]					
SUBSYSTE MDAC ID: ITEM: PD5)	M:		MPS 345 GH2							5, 5	7, 58	то
LEAD ANA	LYSI	':	W.J. MCNICOLL									
ASSESSME	NT:											
	F	ICAL LIGH W/FU	T	R A	EDUNDAN	CY SCR	EENS			CIL		
NASA IOA	[1 [1	/1]	[N	A] [NA] NA]	[]	NA] NA]		[X	*] *	
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* CIL RE	TENT	ION	RATIC	NALE:	(If ap	plicab	I	ADEQUA ADEQUA	TE TE	[]	
REMARKS: REF: RI NOTES.	/NAS	A CI	L OF	12-23	-87 AND	RI/NA						ring

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:										
MDAC ID:	MPS 346 GH2 PRESSURIZATIO									
LEAD ANALYST: W.J. MCNICOLL										
ASSESSMENT:										
CRITICALITY REDUNDANCY SCREENS CIL FLIGHT ITEM										
HDW/FU	NC A	ВС								
NASA [1 /1 IOA [1 /1] [NA] [] [NA] [NA] [NA] NA] [NA]	[X] * []							
COMPARE [/] [] [] []	[N]							
RECOMMENDATIONS:	(If different i	from NASA)								
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* CIL RETENTION	RATIONALE: (If app	plicable) ADEQUATE INADEQUATE	[]							
REMARKS: REF: RI/NASA CI NOTES.	REMARKS: REF: RI/NASA CIL OF 12-23-87 AND RI/NASA FMEA/CIL REVIEW MEETING									

ASSESSME ASSESSME NASA FME	NT I	D:	MPS-3	PS-347X BASELINE []								
SUBSYSTE MDAC ID: ITEM: ASSEMBLY			MPS 347 GH2 P									
LEAD ANA	LYST	:	W.J.	MCN:	ICOLL							
ASSESSME	NT:											
		ICAL:	ITY r	1	REDUN	DANCY	SCR	EENS		CI	L	
			NC	i	A	F	3	•	С	* *	LIM	
NASA IOA	[1 [1	/1 /1]	[]	NA] NA]	[N [N	IA] IA]	[] []	NA] NA]]	х ј ј	*
COMPARE	[/	1	[]	[]	[]	[n]	
RECOMMEN	DATIC	ONS:	(If	di	ffere	nt fr	om N	ASA)				
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* CIL RE	TENTI	ON I	RATION	ALE:	: (If	appl	icab.	1	ADEQUATE ADEQUATE]	
	REF: RI/NASA CIL OF 12-23-87 AND RI/NASA FMEA/CIL REVIEW MEETING											

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	2/02/88 MPS-348X 0521-1	:		NASA DATA: BASELINE NEW	
SUBSYSTEM: MDAC ID: ITEM:	MPS 348 GH2 PRES	SSURIZATI	ON SUPPL	Y LINE (LV52	2 TO PD5)
LEAD ANALYST:	W.J. MC	NICOLL			
ASSESSMENT:					
CRITICAL		REDUNDAL	NCY SCREE	ns	CIL ITEM
FLIGH HDW/FU		A	В	С	
NASA [1 /1 IOA [1 /1] [NA] NA]	[NA] [NA]	[NA] [NA]	[X] *
COMPARE [/] []	[]	[]	[N]
RECOMMENDATIONS	(If d	ifferent	from NAS	SA)	
[/] [1	[]	[] (A	[] ADD/DELETE)
* CIL RETENTION	RATIONAL	Æ: (If a	pplicable	adequate	[]
REMARKS: REF: RI/NASA C	IL OF 12-	-23-87 AN	ID RI/NAS	A FMEA/CIL E	REVIEW MEETING

ASSESSM ASSESSM NASA FM	ENT	'I	ATE:	MPS	2/88 -349 7-1	x				NASA BASE		[
SUBSYST MDAC ID ITEM:				MPS 349 LH2		SE LI	NE (:	PD2 T	O PR6)					
LEAD AN	ALY	ST	:	W.J	. MCN	NICOL	L								
ASSESSMI	ENT	:													
		F	LIGH	ITY IT NC			NDAN	CY SCI				CI	[L TEM	[
		ישני	M/ FU	NC		A		В	(C					
NASA IOA	[1	/1 /1]	[NA] NA]] [NA] NA]	•	NA] NA]		[x]	*
COMPARE	[/]	[]	[]	[]		[N]	
RECOMMEN	[AD]	CIC	ons:	(1	[f di	ffere	ent f	rom N	ASA)						
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* CIL RE	TEN	TI	ON]	RATIC	NALE	: (If	app	licab	A	DEQUA'		[]	
REMARKS: REF: RI 87.	/NA	SA	CI	L OF	12-2	3-87	AND :	RI/NA				•		•	12-14-

ASSESSMENT DAT ASSESSMENT ID: NASA FMEA #:	E: 2/02/88 MPS-3503 XXXXXX	K	NASA DATA: BASELINE [] NEW [X]						
SUBSYSTEM: MDAC ID: ITEM:	MPS 350 LH2 RTLS	S DUMP I	LINE (PD:	2 TO PV17)					
LEAD ANALYST:	W.J. MC	NICOLL							
ASSESSMENT:									
FLI	ALITY GHT FUNC	REDUNDA A	ANCY SCR	eens C	CIL ITEM				
NASA [1 / IOA [1 /	[1] [[1] [NA] NA]	[NA] [NA]	[NA] [NA]	[X] *				
COMPARE [/	, J []	[]	[]	[N]				
RECOMMENDATION	is: (If d	ifferent	from N	ASA)					
[/	'] []	[]	[]	[] ADD/DELETE)				
* CIL RETENTIO	ON RATIONAL	E: (If a	applicab	le) ADEQUATE INADEQUATE					
REMARKS: REF: RI/NASA	CIL OF 12-	23-87.							

ASSESSMENT DASSESSMENT II NASA FMEA #:	D: MPS-3513	S-351X BASELINE []							
SUBSYSTEM: MDAC ID: ITEM:	MPS 351 LH2 RTLS	DUMP LIN	E (PV17 T	O PV18)					
LEAD ANALYST	: W.J. MCN	ICOLL							
ASSESSMENT:									
F	ICALITY LIGHT	REDUNDANC	Y SCREENS		CIL	1			
HDV	W/FUNC	A	В	С					
NASA [1 IOA [1	/1] [/1]	NA] [NA] [NA] [NA] [NA] NA]	[X] *]			
COMPARE [/] [] [] []	[N]			
RECOMMENDATIO	ONS: (If di	fferent f	rom NASA)						
[/] [] [] [[DD/DI] ELETE)			
* CIL RETENT:	ION RATIONALE	: (If app	•	ADEQUATE ADEQUATE]			
REF: RI/NASA	A CIL OF 12-2	3-87 AND	RI/NASA F	MEA/CIL RE	EVIEV	MEETING			

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	MPS-352X	PS-352X BASELINE [628-1 NEW [
	MPS 352 LH2 RTLS DU								
LEAD ANALYST:	W.J. MCNICO	V.J. MCNICOLL							
ASSESSMENT:									
CRITICAL FLIGH		UNDANCY SCREEN	is	CIL ITEM					
HDW/FU		В	С						
NASA [1 /1 IOA [1 /1] [NA]] [NA]	[NA] [[NA] [NA] NA]	[X] *					
COMPARE [/] []	[] []	[и]					
RECOMMENDATIONS:	(If diffe	rent from NASA	7)						
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* CIL RETENTION RATIONALE: (If applicable) ADEQUATE [] INADEQUATE []									
REMARKS: REF: RI/NASA CIL OF 12-23-87 AND RI/NASA FMEA/CIL REVIEW MEETING NOTES.									

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	MPS-353X		NASA DATA: BASELINE NEW					
	MPS 353 LH2 ULLAGE PRESS	URE SIGNA	L CONDITION	IER				
LEAD ANALYST:	W.J. MCNICOLL							
ASSESSMENT:								
	TY REDUNDAN	CY SCREENS	s	CIL				
FLIGHT HDW/FU	NC A	В	С	ITEM				
NASA [2 /1R IOA [2 /1R] [P] [F] [P] P]	[X] *				
COMPARE [/] [] [. J (1	[N]				
RECOMMENDATIONS:	(If different	from NASA)					
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EMARKS: EF: RI/NASA CIL OF 12-23-87 AND RI/NASA FMEA/CIL REVIEW MEETING OTES.								

ASSESSME ASSESSME NASA FME	NT I			PS-354X BASELINE []]			
SUBSYSTEMDAC ID:	M:		MPS 354 LH2 U								2			
LEAD ANA	LYST	:	W.J.	MCN	COLL	ı								
ASSESSME	NT:													
		ICAL LIGH	ITY	1	REDUN	DANCY	SCR	EENS				L LEN	ſ	
	_	W/FU		1	A	В		С					-	
NASA IOA	[2 [2	/1R /1R]	[]	P]	[F [F]	[P]]	X]	*
COMPARE	[/]	[]	[]	C]			N		
RECOMMEN	DATI	ons:	(II	di	ffere	ent fr	om N	ASA)						
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REMARKS: REF: RI	THE PARTY OF THE P													

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ASSESSMENT DATE ASSESSMENT ID: NASA FMEA #:	MPS-355			NASA DATA BASELINE NEW					
SUBSYSTEM: MDAC ID: ITEM:	MPS 355 LH2 ULL								
LEAD ANALYST:	W.J. MC	NICOLL							
ASSESSMENT:									
CRITIC:		REDUNDANC	Y SCREEN	s	CIL ITEM				
		A	В	С	IICM				
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COMPARE [/] [) [] []	[N]				
RECOMMENDATIONS	: (If d	ifferent f	rom NASA)					
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REMARKS:			I	ADEQUATE NADEQUATE	į į				
REF: RI/NASA CIL OF 12-23-87 AND RI/NASA FMEA/CIL REVIEW MEETING									

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	2/02/88 MPS-3603 0626-1	x		NASA DATA BASELINI NEV		;] ;]
SUBSYSTEM: MDAC ID: ITEM:	MPS 360 LH2 INL	ET PRES	SURE TRAN	SDUCER		
LEAD ANALYST:	W.J. MC	NICOLL				
ASSESSMENT:						
CRITICAI FLIGH HDW/FU	T	REDUND.	ANCY SCRE	ENS C	CII	
,			_			1 4
NASA [3 /3 IOA [3 /3] [NA]	[NA] [NA]	[NA]	[] *
COMPARE [/] [1	[]	[]	[1
RECOMMENDATIONS:	(If d	ifferen	t from NA	SA)		
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* CIL RETENTION	RATIONAL	E: (If	applicabl	.e) ADEQUATE INADEQUATE	-]
REMARKS: REF: RI/NASA FI	MEA/CIL R	EVIEW M	EETING NO	TES.		

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	MPS-361X		NASA DATA BASELINE NEW]
	MPS 361 LH2 ENGINE MAN	-	-		
LEAD ANALYST:	W.J. MCNICOLL				
ASSESSMENT:					
FLIGHT				CIL	
HDW/FU	IC A	В	С		
NASA [2 /1R IOA [3 /3] [P]] [NA]	[F] [[NA] [[P] [NA]	[X] *]
COMPARE [N /N] [N]	[и]	[и]	[N]
RECOMMENDATIONS:	(If differer	nt from NASA	A)		
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* CIL RETENTION F	RATIONALE: (If		ADEQUATE INADEQUATE	[]
REMARKS: RELIEF SYSTEM WII REDUNDANCY FOR TH REF: RI/NASA CII NOTES.		INST MANIFOI JRE.	LD RUPTURE.	ИО	

ASSESSMENT DATE ASSESSMENT ID: NASA FMEA #:	MPS-362			BASELINE NEW	
SUBSYSTEM: MDAC ID: ITEM:	MPS 362 GH2 OUT	LET PRESSU	JRE TRANSI	OUCER	
LEAD ANALYST:	W.J. MC	NICOLL			
ASSESSMENT:					
CRITICA FLIG		REDUNDANG	CY SCREENS	5	CIL ITEM
HDW/F	UNC	A	В	С	
NASA [3 /1 IOA [3 /3	R] [P] [NA] [F] [NA] [P] NA]	[X] *
COMPARE [/N] [и] [и][N]	[и]
RECOMMENDATIONS	: (If d	lifferent :	from NASA)	
[3 /3] [NA] [NA] [NA]	[D] DD/DELETE)
* CIL RETENTION	RATIONAL	E: (If ap)	plicable)	A DEQUATE	r 1
			I	ADEQUATE NADEQUATE	[]
REMARKS: TRANSDUCER FAII REF: RI/NASA C NOTES.	URE HAS N IL OF 12-	O EFFECT. -23-87 AND	NO REDU	NDANCY. FMEA/CIL R	EVIEW MEETING

ASSESSMEN				NASA DATA: BASELINE []						
NASA FMEA		0626-4	,		EW [3	()				
SUBSYSTEM MDAC ID:		MPS 363 GH2 DIS	SCONNECT	PRESSUR	E TRANSDUCE	ર				
LEAD ANAL	YST:	W.J. MC	CNICOLL							
ASSESSMEN	T:									
c	RITICAL: FLIGH HDW/FU	r	REDUND.	ANCY SCR B	EENS C	CII				
NASA IOA	[3 /3] [NA]	[NA] [NA]	[NA]	[] *			
COMPARE	[/] []	[]	[]	ξ]			
RECOMMEND	ATIONS:	(If d	lifferen	t from N	ASA)					
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* CIL RET			·	applicab EETING N	ADEQUATE INADEQUATE]			
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ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	2/02/88 MPS-364X 0627-1	PS-364X 527-1 NEW [X]									
SUBSYSTEM: MDAC ID: ITEM: TRANSDUCER	MPS 364 LH2 FEED	54 H2 FEED MANIFOLD DISCONNECT TEMPERATURE									
LEAD ANALYST:	W.J. MCN	W.J. MCNICOLL									
ASSESSMENT:											
CRITICAL		REDUNDAN	CY SCREE	ns	CIL ITEM						
FLIGH HDW/FU		A	В	С							
NASA [2 /1R IOA [2 /1F		P] [P] [F] F]	[P] [P]	[X] *						
COMPARE [/] [] [1	[]	[N]						
RECOMMENDATIONS	(If di	fferent	from NAS	SA)							
(/] [] [1	[] (A)	[] LDD/DELETE)						
* CIL RETENTION	RATIONALE	E: (If ap	plicable	ADEQUATE	[]						
REMARKS: REF: RI/NASA C NOTES.	IL OF 12-2	23-87 AND	RI/NASA	A FMEA/CIL F	REVIEW MEETING						

ASSESSMI ASSESSMI NASA FMI	ENT I	D:	2/02 MPS- 0627	365	X				NASA BASI	ELINE] (]	
SUBSYSTI MDAC ID: ITEM:			MPS 365 LH2	ENG	INE IN	\LET	TEMPE	ERATU	JRE TF	ANSD	UCEF	₹	
LEAD ANA	LYST	:	W.J.	MC	NICOLI	_							
ASSESSME	ENT:												
	F	ICAL LIGH W/FU			REDUN A	IDANG	CY SCR		c		CIL		
NASA IOA	[3 [3	/3 /3]	[NA] NA]]	NA] NA]	[NA] NA]		[]	*
COMPARE	[/]	[]	[]	[]		[]	
RECOMMEN	DATIC	ons:	(If	di	ffere	nt f	rom N	ASA)					
	[/]	£]	()	£.]	(AI	[DD/DI] ELE	TE
* CIL RE REMARKS: REF: RI			RATION EA/CIL					IN	ADEQUI ADEQUI		[]	

ASSESSME ASSESSME NASA FME	ENT	I	D:	MPS-3	MPS-366X BASELINE						-					
SUBSYSTE MDAC ID:				MPS 366 ENGIN									, 2	2,	3)	
LEAD ANA	LY	ST	:	W.J. 1	1C)	1IC	COLL									
ASSESSME	ENT	:														
	CR			<u>I</u> TY		RI	EDUNDA	ANO	CY	SCREI	ENS	3		CIL		
	I		LIGHT W/FUI	NC NC		A			В			С	1.	ΓEN	1	
NASA IOA	[2	/1R /1]	[P N2]	[F NA]]	P] NA]	[X]	*
COMPARE	[N	/N]	[N]	[N]	[N]	[N]	
RECOMMEN	IDA'	ΓI	ONS:	(If	d:	ifi	ferent	t 1	fro	om NAS	SA)	1				
	[1	/1]	[N	A]	[NA	\]	[•	/DI	-	ETE)
* CIL RE	ETE	NT:	ION 1	RATION	ALI	€:	(If a	app	oli	cable	•	ADEQUATE]	
REMARKS:		LL	DEP	LETE A	LL	3	TANKS	5 1	OF	R THE		FFECTED EN	•	ΝE	SY	STEM
						-						ESCAPING				

OVERPRESSURIZE THE AFT COMPARTMENT (CRIT 1).
REF: RI/NASA CIL OF 12-23-87 AND RI/NASA FMEA/CIL REVIEW MEETING NOTES.

ASSESSME ASSESSME NASA FME	NT	ID:	•	− 367X				ŀ	IASA I BASEI		[x]	
SUBSYSTE MDAC ID: ITEM:			MPS 367 HEL		PPLY	DIS	CONNE	CT (I	PD8)				
LEAD ANA	LYS	T:	W.J	. MCNI	COLL	•							
ASSESSME	ENT:												
		FLIGH	IT	R			Y SCR B	EENS	•		CI	L EM	
		DW/FU					_						
NASA IOA]	3 /3 3 /3]	[N	A] A]	[NA] NA]	1] 1]	NA] NA]		[]	*
COMPARE	ſ	/]	[]	[]	[]		[]	
RECOMMEN	IDAT	IONS:	(If dif	fere	nt f	rom N	ASA)					
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* CIL RE		TION	RATI	ONALE:	(If	app	licab	1	ADEQUA ADEQUA]	
		SA FN	MEA/C	IL REV	'IEW	MEET	ING N	OTES.					

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	MPS-369X			NASA DATA: BASELINE NEW	[x]
SUBSYSTEM: MDAC ID: ITEM: (CV25,26,36,37,4	MPS 369 ENGINE HE 1,42)	LIUM SUP	PLY CHEC	K VALVE	
LEAD ANALYST:	W.J. MCNI	COLL			
ASSESSMENT:					
CRITICAL	-	REDUNDANC	Y SCREEN	S	CIL ITEM
FLIGH HDW/FU		A	В	С	
NASA [1 /1 IOA [1 /1] [1	NA] [NA] [NA] [AN NA] [NA] NA]	[X] *
COMPARE [/] [] [] []	[N]
RECOMMENDATIONS	(If di	fferent f	rom NASA	4)	
[/] [] []	[] (A	[] DD/DELETE)
* CIL RETENTION	RATIONALE	: (If apr) ADEQUATE INADEQUATE	
REMARKS: REF: RI/NASA C NOTES.	IL OF 12-2	3-87 AND	RI/NASA	FMEA/CIL R	EVIEW MEETING

ASSESSM ASSESSM NASA FM	ENI	'I	D:	MPS-3	2/03/88 MPS-370X 0205-3				NASA DATA: BASELINE [] NEW [X]									
SUBSYST MDAC ID ITEM:	-			MPS 370 ENGIN	E	HE	LIUM	PR	ES	SUR	E REC	ULA	TOR	(PR	L , 2	, 3	,7,	8,9)
LEAD AN	ALY	ST	:	W.J.	MC	NI	COLL											
ASSESSM	ENT	:																
	CR		ICALI LIGHT			R	EDUN	DAN	CY	SCI	REENS	;			IL			
		HD	W/FUN	1C		A			В			С		1	TE	M		
NASA IOA		2	/1R /]	[P]	[F]]	P]		[x]	*	
COMPARE	[N	/N]	[N]	[N]	[N]		[N]		
RECOMME	NDA!	ric	ons:	(If	d:	if1	ferer	nt f	rc	om N	IASA)							
	[/]	[1	[]	ſ]	(] (ADD	D / DI		TE)	
* CIL RE											IN	ADEQ	UATE UATE]		
THE REGU	ILAI	OF	IS	NOT RE	QU	IR	ED T	O R	EM	AIN	CLO	SED.						

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	MPS-371	x		NASA DATA: BASELINE NEW				
MDAC ID:		371 ENGINE REGULATOR OUTLET CHECK VALVE						
LEAD ANALYST:	W.J. MC	NICOLL						
ASSESSMENT:								
FLIGH	T	REDUNDANO			CIL ITEM			
HDW/FU	NC	A	B .	С				
NASA [1 /1 IOA [1 /1] [NA] [NA] [NA] [NA] [NA] NA]	[X] *			
COMPARE [/] [] [] [1	[N]			
RECOMMENDATIONS:	(If d	ifferent f	rom NASA	۲)				
[/] [] [] [] (AI	[] DD/DELETE)			
* CIL RETENTION	RATIONAL	E: (If app	·	ADEQUATE	[]			
REMARKS: REF: RI/NASA CI NOTES.	L OF 12-	23-87 AND	RI/NASA	FMEA/CIL RE	EVIEW MEETING			

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	MPS-372X	NASA DATA: BASELINE [] NEW [X]						
MDAC ID:	MPS 372 ENGINE HELIUM	SUPPLY INTERCONNECT OF	UT VALVE					
LEAD ANALYST:	W.J. MCNICOLL							
ASSESSMENT:								
CRITICAL: FLIGHT		ANCY SCREENS	CIL ITEM					
HDW/FUN	=	в с	1164					
NASA [3 /1R IOA [3 /3] [P]] [NA]	[F] [P] [NA] [NA]	[X] *					
COMPARE [/N] [N]	[N] [N]	[N]					
RECOMMENDATIONS:	(If differen	t from NASA)						
[3 /3] [NA]		[D] DD/DELETE)					
* CIL RETENTION F	RATIONALE: (If	,						
		ADEQUATE INADEQUATE	[]					
	EAK IS A 1/1 FA NGINES ARE NOT	I/NASA CITES A LEAK AS ILURE IN ISOLATION AND REDUNDANT.	S A SECOND					

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	2/04/88 MPS-3733 0261-3	S-373X S1-3 NEW [X]									
SUBSYSTEM: MDAC ID: ITEM: (CV28,39,44)	MPS 373 ENGINE	HELIUM :	INTERCONNE	CT OUT CHEC	K VALVE						
LEAD ANALYST:	W.J. MC	NICOLL									
ASSESSMENT:											
CRITICALITY REDUNDANCY SCREENS CIL ITEM											
FLIG HDW/F											
NASA [1 /1 IOA [1 /1] [NA]	[NA] [NA]	[NA] [NA]	[X] *						
COMPARE [/] [[]	[]	[]	[N]						
RECOMMENDATIONS	: (If d	lifferer	nt from NA	SA)							
[/]	[]	[]	[]	[] ADD/DELETE)						
* CIL RETENTION	RATIONA	LE: (If	applicabl	.e) ADEQUATE INADEQUATE							
REMARKS: REF: RI/NASA (NOTES.	CIL OF 12	-23-87	AND RI/NAS	SA FMEA/CIL	REVIEW MEETING						

ASSESSMI ASSESSMI NASA FMI	ENT II	ATE: 2/0 D: MPS 025	-374X				A DATA: SELINE (NEW (
SUBSYSTI MDAC ID: ITEM: (CV27,38	:	MPS 374 ENG		UM IN	rerco:	NNECT IN	CHECK V	'ALVE	
LEAD ANA	LYST:	W.J	. MCNICO	LL					
ASSESSME	ENT:								
	FL	CALITY IGHT	RED	UNDANC	CY SCI	REENS		IL TEM	
	HDW	/FUNC	A		В	С	-	ILM	
NASA IOA	[1 ,	/1] /1]	[NA] [NA]	[NA] NA]]	x] *	k
COMPARE	[,	/]	[]	[]	[]	[N]	
RECOMMEN	DATIO	NS: (I	f diffe	rent f	rom N	ASA)			
		/]		[]	[]] DELET	'E)
* CIL RET	PENTIC	ON RATIO	NALE: (If app	licab	le) ADEQU INADEQU	JATE []	
	/NASA	CIL OF	12-23-87	AND 1	RI/NA:	SA FMEA/C	-	EW ME	ETING

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	MPS-375X	PS-375X BASELINE []						
MDAC ID:	MPS 375 PNEUMATIC HELIUM	SUPPLY CHECK VALVE	(CV4)					
LEAD ANALYST:	W.J. MCNICOLL							
ASSESSMENT:								
FLIGH	=		CIL ITEM					
HDW/FU	NC A	ВС						
NASA [2 /1R IOA [1 /1] [P] [] [NA] [F] [P] NA] [NA]	[X] * []					
COMPARE [N /N] [N] [и] [и]	[и]					
RECOMMENDATIONS:	(If different	from NASA)						
[1 /1] [NA] [NA] [NA] (AI	[] DD/DELETE)					
* CIL RETENTION	RATIONALE: (If ap	plicable) ADEQUATE INADEQUATE	[]					
REMARKS: POSSIBLE OVERPRE REF: RI/NASA CI NOTES.	SSURIZATION. L OF 12-23-87 AND	RI/NASA FMEA/CIL RI	EVIEW MEETING					

ASSESSME ASSESSME NASA FME	NT I	D:	MPS-	-376X	3			N	IASA DATA BASELINE NEW] :]	
SUBSYSTEMDAC ID: ITEM: CHECK VA				PRES	SURIZ	ATION	MAN	IIFOLI	REPRESS	UR]	[Z	ATI(ON
LEAD ANA	LYST	:	W.J	. MCN	ICOLI	ı							
ASSESSME	NT:												
CRITICALITY REDUNDANCY SCREENS CIL FLIGHT ITEM HDW/FUNC A B C													
NASA IOA	[1	/1 /1]	[NA] NA]	[N.	A] A]	[N	IA] IA]	[X]	*
COMPARE	[/]	[]	[]	[]	[N]	
RECOMMEN	DATI	ons:	(1	f di	ffere	nt fr	om N	IASA)					
	[/]	[]	[]	[] (A] ELE:	ΓE)
* CIL RE	TENT	ION 1	RATIO	ONALE	: (If	appl	icab	À	DEQUATE]]	
	/NAS	A CI	L OF	12-2	3-87	AND R	I/NA	SA FM	EA/CIL R	EVI	EV	M M	EETING

ASSESSMENT I ASSESSMENT I NASA FMEA #:	D:		NASA DATA: BASELINE [] NEW [X]										
SUBSYSTEM: MDAC ID: ITEM: (CV12)		MPS 377 LO2 FEE	D MANIFO	LD REPRES	SSURIZATION	CHECK VALVE							
LEAD ANALYST	? :	W.J. MC	NICOLL										
ASSESSMENT:													
	TICAL FLIGH		ITEM										
		NC	A	В	С								
NASA []	l /1 l /1] [NA] NA]	[NA] [NA]	[NA] [NA]	[X] * []							
COMPARE [/] []	[]	[]	[N]							
RECOMMENDAT	cons:	(If d	ifferent	from NA	SA)								
[/] []	[]	[] (A	[] .DD/DELETE)							
* CIL RETENT	rion	RATIONAL	E: (If a	applicabl	e) ADEQUATE INADEQUATE								
REMARKS: REF: RI/NAS NOTES.	SA CI	L OF 12-	·23-87 AN	ID RI/NAS	A FMEA/CIL R	REVIEW MEETING							

ASSESSME ASSESSME NASA FME	NT	I	D:	MPS-37	S-378X				NASA DATA: BASELINE [] NEW [X]								
SUBSYSTE MDAC ID: ITEM: CHECK VA					Œ	SSU	JRIZAT	PI(ИС	MANI	FO:	LD	REPRES	SUR	IZ	AT:	ION
LEAD ANA	LY	ST	:	W.J. N	[C])II	COLL										
ASSESSME	NT	:															
		F	ICAL: LIGH: W/FUI			RI A	EDUND?	AN(CY B	SCRE	ENS	S C			IL PEN	1	
NASA IOA	[2	/1R /3]	[P N2]	[F NA]	[P NA] A]	[x]	*
COMPARE	[N	/N]	[N]	C	N]	[N]	[N]	
RECOMMEN	DA'	ΓI	ons:	(If	d:	Ĺfí	erent	: :	fro	om NAS	SA)	ļ					
	[3	/3]	[NA	\]	[NA	\]	[N2		[ADD,			ETE)
* CIL RE	TE	NT:	ION I	RATIONA	LI	G :	(If a	p	pli	.cable	-	AI IAI	DEQUATE DEQUATE	[]	
PRESSURI REF: RI								I	DEG	RADEI) [UN	MP.				

ASSESSMENT DATE: 2/04/88 ASSESSMENT ID: MPS-379X NASA FMEA #: 0605-4														DAT ELIN NE]			
SUBSYSTEM: MPS MDAC ID: 379 ITEM: GH2 PRESSURIZATION CHECK VALVE (CV13) LEAD ANALYST: W.J. MCNICOLL								'IO	N	MAN	IIFO	LD	RE	PRES	SU	RI	ZA	TI	ON		
LEAD ANA	LYS	T:	:	W.	J. M	(C)	NI(COL	L												
ASSESSME	NT:	:																			
	CR		CAL				RI	EDU	NDA	NC	Y	SCF	REEN	s				CI IT		f	
	I		LIGH: W/FUI	_			A				В			С						•	
NASA IOA	[2 2	/1R /1R]		[P P]]	F F]	[[P P]			[X X]	*
COMPARE	[/]		[]		[]	[]			[]	
RECOMMEN	IDA!	ΓI	ons:		(If	đ	if	fer	ent	: f	r	om 1	NASA	.)							
	[/	1		[]		[]	[]	((AD	•] ELH	ETE)
* CIL RI		NT:	ION :	RAI	'ION	AL	E:	(I	f a	app) 1:	ical		A NA	DEQ DEQ	UATI UATI	E]]	
REMARKS:		AS.	A FM	EA/	'CIL	R	EV	IEW	MI	EET	ľI	NG 1	NOTE	s.							

ASSESSME ASSESSME NASA FME	INT :	ID:	2/04 MPS- 0632	-380X			NASA DATA: BASELINE [] NEW [X]					
SUBSYSTE MDAC ID: ITEM: CHECK VA		(CV1	MPS 380 LH2 4)	RECIRC	ULATIO	n man	IFOLD	REPRESSU	URIZA	TION		
LEAD ANA	LYS	r:	W.J.	MCNIC	OLL							
ASSESSME	NT:											
CRITICALITY REDUNDANCY SCREENS CIL FLIGHT ITEM HDW/FUNC A B C												
NASA IOA	[]	l /1 l /1]	[NA [NA] [NA]	[]	NA] NA]	[X] *		
COMPARE	[/]	[] []	[]	[14]		
RECOMMEN	DAT]	ons:	(I	f diffe	erent	from 1	NASA)		,			
	[/]	[:] []	[] (A	[DD/D] ELETE)		
* CIL RE							INA	ADEQUATE ADEQUATE	•]		
REF: RI	/ NAS	SA CI	L OF	12-23-8	37 AND	RI/NA	ASA FM	IEA/CIL R	EVIE	W MEETI	NG	

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	2/05/88 MPS-3813 0630-4	BASELINE []								
SUBSYSTEM: MDAC ID: ITEM: (CV15)	MPS 381 LH2 FEEI	D MANIFOLI	ANIMON C	L REPRESS C	HECK VALVE					
LEAD ANALYST:	W.J. MCI	NICOLL								
ASSESSMENT:										
CRITICAL FLIGH HDW/FU	T	REDUNDANO A	CY SCREE	15 C	CIL ITEM					
115W/10										
NASA [1 /1 IOA [1 /1] [NA] [NA] [NA] NA]	[NA] [NA]	[X] *					
COMPARE [/				[]	[N]					
RECOMMENDATIONS:	(If d	ifferent	from NAS	A)						
[/] [] []	[] (A)	[] .DD/DELETE)					
* CIL RETENTION	RATIONAL	E: (If ap	_) ADEQUATE INADEQUATE						
REMARKS: REF: RI/NASA CI NOTES.	L OF 12-	23-87 AND	RI/NASA	FMEA/CIL R	EVIEW MEETING					

ASSESSMENT DATE ASSESSMENT ID: NASA FMEA #:	: 2/05/88 MPS-382X 0605-2	/05/88 NASA DATA: PS-382X BASELINE [605-2 NEW [X							
SUBSYSTEM: MDAC ID: ITEM: CHECK VALVE (CV	GH2 PRES	SURIZATION MANIFO	OLD REPRESSU	JRIZATION					
LEAD ANALYST:	W.J. MCN	ICOLL							
ASSESSMENT:									
CRITICALITY REDUNDANCY SCREENS CIL FLIGHT ITEM									
HDW/F	UNC I	A B	С						
NASA [2 /1 IOA [3 /3	R] []	P] [F] NA] [NA]	[P] [NA]	[X] *					
COMPARE [N /N] [1	иј [и]	[N]	[и]					
RECOMMENDATIONS	(If di	fferent from NASA	7)						
[3 /3] [1	NA] [NA] [[D] DD/DELETE)					
* CIL RETENTION	RATIONALE	: (If applicable)	ADEQUATE INADEQUATE	[]					
		NIFOLD. NO LOSS 3-87 AND RI/NASA	OF CREW OR	VEHICLE.					

ASSESSMENT ASSESSMENT NASA FMEA	ID:		PS-383X BASELINE []							
SUBSYSTEM: MDAC ID: ITEM: CHECK VALVE			SSURIZAT	TION MANIF	OLD REPRESS	URIZATION				
LEAD ANALYS	ST:	W.J. MC	NICOLL							
ASSESSMENT	ASSESSMENT:									
CRITICALITY REDUNDANCY SCREENS CIL FLIGHT ITEM HDW/FUNC A B C										
NASA [IOA [1 /1 1 /1] [NA] NA]	[NA] [NA]	[NA] [NA]	[X] *				
COMPARE [/] []	[]	[]	[N]				
RECOMMENDA!	rions:	(If d	ifferent	: from NAS	SA)					
[/] []	[]	[] (A	[] DD/DELETE)				
* CIL RETER					ADEQUATE INADEQUATE	į				
REF: RI/NA NOTES.	ASA CI	L OF 12-	·23-87 Al	ND RI/NASA	A FMEA/CIL R	EVIEW MEETING				

ASSESSME ASSESSME NASA FME	ENT :	ID:	2/05 MPS- 0248	MPS-384X BASELINE []							
SUBSYSTE MDAC ID: ITEM: VALVE (C	:		384	FEED MA	NIFOLD RT	LS REPRES	SURIZAT	OION	СНЕСК		
LEAD ANA	LYS	r:	W.J.	MCNICO	LL						
ASSESSME	ENT:										
	1	FLIGH	T		UNDANCY SO			CIL ITEN	1		
	HI	DW/FU	NC	A	В	С					
NASA IOA	[]	1 /1]	[NA] [NA]	[NA] [NA]	[NA] [NA]		x]] *		
COMPARE	[/]	[]	[]	[]		[N]		
RECOMMEN	[DAT]	ions:	(I	f diffe	rent from	NASA)					
	[/]	[]	[]	[]		[D/DI] ELETE)		
* CIL RE	TENT	NOIT	RATIO	NALE: (If applica	ADE		[j		
REMARKS: H2 LEAKA REF: RI NOTES.	GE]	INOT SA CI	AFT C L OF	OMPARTM 12-23-8	ENT AFTER 7 AND RI/N	ISOLATIO	QUATE N VALVE ./CIL RE	IS	OPENED. MEETING		

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	MPS-385X	NASA DATA BASELINE NEW	
MDAC ID:	MPS 385 PNEUMATIC HELIUM	SUPPLY ISOLATION V	ALVE (LV7, 8)
LEAD ANALYST:	W.J. MCNICOLL		
ASSESSMENT:			
CRITICAL FLIGH HDW/FU	T	CY SCREENS B C	CIL ITEM
NASA [1 /1 IOA [1 /1] [NA] [] [NA] [NA] [NA] NA] [NA]	[X] *
COMPARE [/] [] [] []	[и]
RECOMMENDATIONS:	(If different	from NASA)	
[/] [] [] []	[] ADD/DELETE)
* CIL RETENTION	RATIONALE: (If ap	plicable) ADEQUATE INADEQUATE	-
REMARKS: REF: RI/NASA CI NOTES.	L OF 12-23-87 AND	RI/NASA FMEA/CIL F	REVIEW MEETING

ASSESSMI ASSESSMI NASA FMI	ENT I	D:	MPS-3	386X				1	NASA D BASEL		[x]	
SUBSYSTIMDAC ID: ITEM: (LV12,14	:								OOWNST			ΟF	C7	79
LEAD AND	ALYST	:	W.J.	MCN	ICOLL									
ASSESSMI	ENT:													
	F	LIGH'	ITY T NC		REDUN A		SCR	EENS				LEM	ſ	
NASA IOA	[1	/1 /1]	[]	NA] NA]	[N	IA] IA]	1]	IA] IA]		[x]	*
COMPARE	[/]	[]	[]	[]		[N]	
RECOMMEN	IDATI	ons:	(If	di	ffere	nt fr	com N	ASA)						
	[/	1	[]	[]	[1	(AE		DE		TE)
* CIL RE		ION 1	RATION	ALE	: (If	appl	ic a b.	P	DEQUA		[]	
		A CI	L OF 1	2-23	3 - 87 <i>i</i>	AND F	RI/NA	SA CI	L WOR	KSHE	EI	' C	F	12-14-

ASSESSME ASSESSME NASA FME	NT I	D:	MPS-	-387X					BASE		[]	
SUBSYSTE MDAC ID: ITEM: (LV12,14					TUATI							F	CV	9
LEAD ANA	LYST	:	W.J.	MCN	ICOLL	ı								
ASSESSME	NT:													
		LIGH			REDUN	DANCY E		EENS	2			L	I	
		•												
NASA IOA	[1	/1 /1]	[[NA] NA]	[N [N	A] A]	[N	IA] IA]		[X]	*
COMPARE	[/]	[]	[]	[]		[N]	
RECOMMEN	DATI	ons:	(:	[f di	ffere	nt fr	om N	ASA)						
	[/]	[]	[1	[]	(Al	[DD/	/DE] ELE	TE)
* CIL RE		ION	RATI(ONALE	E: (If	appl	icab.	1	ADEQUA ADEQUA		[]	
		A CI	L OF	12-2	23-87	AND F	RI/NA	SA C	L WO	RKSH:	EE:	ר כ	F	12-14-

ASSESSME ASSESSME NASA FME	NT ID:	MPS-388	x				A DATA: SELINE NEW	[[]
SUBSYSTEMDAC ID: ITEM: (LV28,29		MPS 388 VALVE A 2,33,34,				ID VALVE	S UPST	REAM	OF CV9
LEAD ANA	LYST:	W.J. MC	NICO:	LL					
ASSESSME	NT:								
•	CRITICAL FLIGH	JTY	RED	UNDANC	y scr	EENS		CIL	•
	HDW/FU		A	:	В	С	•	ITEM	1
NASA IOA	[2 /1R [2 /1R] [P] P]	[]	F] F]	[P] [P]		(X] *]
COMPARE	[/] []	[]	[]		[N]
RECOMMEN	DATIONS:	(If d	iffe	rent f	rom N	ASA)			
	[/] []	[]	[]		(D/DE] :LETE)
* CIL RET	TENTION	RATIONAL	E: (If app	licab	ADEC	UATE UATE	[]
REF: RI,	/NASA CI	L OF 12-	23-8	7 AND 1	RI/NA	SA CIL W	ORKSHE	ET O	F 12-9-

ASSESSMEN ASSESSMEN NASA FMEA	T II):	MPS-38	392									DATA: LINE NEW	[x]		
SUBSYSTEM MDAC ID: ITEM: (LV28,29,			MPS 389 VALVE 2,33,34							OID	VAI	LVES	UPST	ľRI	EAM	1 0)F C	7 9
LEAD ANAL	YST	:	W.J. 1	MCI	NI(COLL												
ASSESSMEN	T:																	
C		ICAL: LIGH'			RI	EDUNDA	AN	CY	SCF	REEN	IS				LEV LEV	1		
			NC		A			В			С							
NASA IOA	[2 [2	/1R /1R]	[P P]	[F F]	[P P]		[X]	*	
COMPARE	[/]	[]	[]	(•]		[N]		
RECOMMEND	ATI	ons:	(If	d :	if	feren	t :	fr	om N	NASA	A)							
	[/]	[]	(]	İ	•]	(A] DD,	/DI	ELI]	ETE)	
* CIL RET	ENT	ION :	RATION	AL	Е:	(If	ap;	pl:	icak		A.		ATE ATE]		
REMARKS: REF: RI/	'NAS	A CI	L OF 1	2-	23	-87 A	ND	R	I/NA	ASA	CI	L WC	RKSH	EE'	r (OF	12-	9-

ASSESSM ASSESSM NASA FM	ENT ID:	,	390X			DATA: CLINE [] NEW [X]
SUBSYST MDAC ID ITEM:		MPS 390 LH2	MANIFOL	D REPRESSU	JRIZATION V	ALVES (LV42, 43)
LEAD AN	ALYST:	₩.J.	MCNICO	LL		
ASSESSM	ENT:					
	CRITIC FLI		RED	UNDANCY SO	REENS	CIL ITEM
	HDW/	FUNC	A	В	С	
NASA IOA	[1 /	1] 1]	[NA] [NA]	[NA] [NA]	[NA] [NA]	[X] *
COMPARE	[/]	[]	[]	[]	[и]
RECOMME	NDATION	S: (I	f diffe	rent from	NASA)	
	[/]	[]	[]	[]	[] (ADD/DELETE)
* CIL RI		N RATIO	NALE: (If applica	ble) ADEQU INADEQU	
		(LV42)	IS 1/1.	OUTBOARD	VALVE (LV	43) IS 2/1R.

ASSESSME ASSESSME NASA FME	ТN	II):	MP	11/8 S-39 15 - 4	13	ζ									DATA ELINI NEI]	
SUBSYSTE MDAC ID: ITEM: SOLENOID		LV:		MP 39 LH	1	C]	ERC	ULA	TI	ON		oisc	:ONN	ECI	r V	ALVE	OPE	ENI	[NG	}
LEAD ANA	LY:	ST	:	w.,	J. M	(C)	1I(OLI												
ASSESSME	NT	:																		
		F	ICAL: LIGH! W/FU	r			RI A	EDUN	IDA		Y B	SCR	REEN	s c				[L [E]		
NASA IOA	[2 2	/1R /1R]		[P P]] [F F]	[P P]		[x]	*
COMPARE	[/]		[]		[]	[]		[N]	
RECOMMEN	DA'	TI	ons:		(If	d :	if	fere	ent	f	r	om N	IASA)						
	[/	1		[]		[]	[]	([ADD,	/ D]] ELF	ETE)
* CIL RE										pp	1:	icak		A		UATE UATE	-]	
REF: RI	/ N	NO.	W CT	ьO	L T	. – ،	43	-0/	•											

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	MPS-393X		NASA DATA: BASELINE NEW	
MDAC ID:	MPS 393 LATCH LOCK	ING SOLENOIDS	(OV65, 67)	
LEAD ANALYST:	W.J. MCNICO	OLL		
ASSESSMENT:				
CRITICAL: FLIGH		DUNDANCY SCREE	ens	CIL ITEM
HDW/FU		В	С	IIEM
NASA [3 /1R IOA [3 /1R] [P]] [F]] [F]	[P] [P]	[X] *
COMPARE [/] []] []	[]	[N]
RECOMMENDATIONS:	(If diffe	erent from NAS	SA)	
[/] []] []		[] DD/DELETE)
* CIL RETENTION I	RATIONALE: (·	ADEQUATE	[]
REMARKS: REF: RI/NASA CII 87.	C OF 12-23-8	37 AND RI/NASA	CIL WORKSHE	ET OF 12-11-

	2/11/88 MPS-394X 0263-3			NASA DATA BASELINE NEW	
MDAC ID:	MPS 394 LATCH HOO	K			
LEAD ANALYST:	W.J. MCNI	COLL			
ASSESSMENT:					
CRITICAL FLIGH		EDUNDANC	Y SCREE	ns	CIL ITEM
HDW/FU			В	С	
NASA [2 /1R IOA [2 /1R] [P] [P] P]	[P] [P]	[X] *
COMPARE [/] [] []	[]	[N]
RECOMMENDATIONS:	(If dif	ferent i	from NAS	SA)	
[/] [] []	[] (A	[] .DD/DELETE)
* CIL RETENTION	RATIONALE:	(If app	plicable	ADEQUATE	
REMARKS: REF: RI/NASA CI 87.	L OF 12-23	-87 AND	RI/NASA	CIL WORKSH	EET OF 12-15-

ASSESSMI ASSESSMI NASA FMI		MPS-39	5X					ASA DATA BASELINE NEW	
SUBSYSTE MDAC ID:		MPS 395 LATCH	LOCK	SOLEN	OID	(LV6	5,	67)	
LEAD ANA	LYST:	W.J. M	CNIC	OLL					
ASSESSME	ENT:								
	CRITICAL FLIGH	IT	RE	DUNDAN	CY	SCREE	ns		CIL ITEM
	HDW/F	JNC	A		В		С		
NASA IOA	[2 /1H	R]	[P] [F F]	[P [P]	[X] *
COMPARE	[/]	[] [)	[]	[N]
RECOMMEN	DATIONS:	(If	diff	erent	fro	m NAS	A)		
	[/	1	() (]	[[] DD/DELETE)
* CIL RE		RATIONA	LE:	(If ap	pli		AI	DEQUATE DEQUATE	[]
		L OF 12-	-23-	37 AND	RI,	/NASA	CII	L WORKSHI	EET OF 12-15-

ASSESSME ASSESSME NASA FME	NT ID:									SA DATA ASELINE NEW	[
SUBSYSTEMDAC ID:		MPS 396 LATCH U	JNLC	OCK SO	OLE	:NC)ID	(LV6	6,	68)				
LEAD ANA	LYST:	W.J. MC	CNIC	COLL										
ASSESSME	NT:													
	CRITICA: FLIG		RI	EDUNDA	ANC	Y	SCRI	EENS				L LEN	1	
	HDW/F	UNC	A			В			С					
NASA IOA	[2 /1] [2 /1]	R] R]	[P [P]	[P P]	[P P]	[X]	*
COMPARE	[/	1	[]	[3	[]	[N]	
RECOMMEN	DATIONS	: (If	dif:	feren [.]	t 1	fro	om N	ASA))					
	[/]	[]	[]	[] (A] ,DD,	/ DI] ELJ	ETE)
* CIL RE	TENTION	RATIONA	LE:	(If	app) 1:	icab			DEQUATE DEQUATE]	
REMARKS: REF: RI 87.	/NASA C	IL OF 12	-23	-87 A	ND	R	I/NA	SA (CI	L WORKSH	EE'	T (OF	12-12

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	MPS-397X		NASA DATA BASELINE NEW	
SUBSYSTEM: MDAC ID: ITEM:	MPS 397 LATCH UNL	OCK SOLENO	PID (LV66, 68)	
LEAD ANALYST:	W.J. MCNI	COLL		
ASSESSMENT:				
CRITICAL: FLIGHT		REDUNDANCY	SCREENS	CIL
HDW/FU		В	С	ITEM
NASA [3 /1R IOA [3 /1R] [P) [F] [P]] [P]	[X] *
COMPARE [/] [] [] []	[N]
RECOMMENDATIONS:	(If dif	ferent fro	m NASA)	
\]] [] [[] DD/DELETE)
* CIL RETENTION F	RATIONALE:	(If appli	cable) ADEQUATE INADEQUATE	[]
REMARKS: REF: RI/NASA CII	L OF 12-23	-87 AND RI	/NASA CIL WORKSHE	. ,

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	MPS-398X		INE [] NEW [X]
SUBSYSTEM: MDAC ID:	MPS 398 LATCH UNLOCK SOLE		
LEAD ANALYST:	W.J. MCNICOLL		
ASSESSMENT:			
CRITICAL: FLIGHT HDW/FUI		B C	CIL ITEM
NASA [3 /1R IOA [3 /1R] [P] [] [P]	F] [P] F] [P]	[X] *
COMPARE [/] [] [] []	[и]
RECOMMENDATIONS:	(If different i	from NASA)	
[/] [] [] []	[] (ADD/DELETE)
* CIL RETENTION	RATIONALE: (If app	plicable) ADEQUA INADEQUA	
REMARKS: REF: RI/NASA CI 87.	L OF 12-23-87 AND	RI/NASA CIL WOR	KSHEET OF 12-12-

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	MPS-399X		SA DATA: BASELINE [] NEW [X]
SUBSYSTEM: MDAC ID: ITEM: (LV74, 75)	MPS 399 LH2 FEED MA	NIFOLD RTLS PRESS	URIZATION VALVE
LEAD ANALYST:	W.J. MCNICO	LL	
ASSESSMENT:			
CRITICAL FLIGH		UNDANCY SCREENS	CIL ITEM
HDW/FU	NC A	В С	
NASA [1 /1 IOA [1 /1] [NA]] [NA]	AN] [AN] AN] [AN]	[X] *
COMPARE [/] []	[] [] [N]
RECOMMENDATIONS:	(If diffe:	rent from NASA)	
]] []	[] [] [] (ADD/DELETE)
* CIL RETENTION	RATIONALE: (AD	EQUATE [] EQUATE []
REMARKS: REF: RI/NASA CI NOTES.	L OF 12-23-8	7 AND RI/NASA FME	A/CIL REVIEW MEETING

ASSESSMEI ASSESSMEI NASA FME	II TN		2/15/ MPS-4 0602-	00X						DATA: LINE NEW	[-		
SUBSYSTEM MDAC ID:	M:		MPS 400 LO2 M	ANIF	OLD	REPRES	SSUF	RIZATI	ON R	EGUL#	ATOR	! (1	PR5)	
LEAD ANA	LYST	:	W.J.	MCNI	COLI	,								
ASSESSME	NT:													
•	CRIT	ICAL LIGH		F	EDUN	IDANCY	SCI	REENS			CII			
		W/FU		A		В		C	:					
NASA IOA		/1R /1R]	[E	?] ?]	[F [F]	[E	?] ?]		[}	()]	*	
COMPARE	[/]	[]	(]	[]		[]	1]		
RECOMMEN	DATI	ons:	(If	dif	fere	ent fr	om 1	NASA)						
	[/]	[]	[]	[]	(A)) DEL	ETE)	
* CIL RE	* CIL RETENTION RATIONALE: (If applicable) ADEQUATE [] INADEQUATE []													
REMARKS: FAILURE (LV40, 4	REMARKS: FAILURE OF REGULATOR FOLLOWED BY FAILURE OF BOTH SOLENOID VALVES (LV40, 41) WILL RESULT IN HELIUM INJECTION INTO THE LO2 MANIFOLD.													

REF: RI/NASA CIL OF 12-23-87 AND RI/NASA FMEA/CIL REVIEW MEETING

NOTES.

ASSESSMENT DATE: 1/28/88 ASSESSMENT ID: MPS-401X NASA FMEA #: 2071-1											SA DATA ASELINE NEW]	
SUBSYSTEMDAC ID:	M:		EPD&C, 401 TOGGLI			н (з)							
LEAD ANA	LYS'	T:	R. 0'1	00	NNELL									
ASSESSME	NT:													
•		TICAL FLIGH	ITY		REDU	NDAN	C:	y sc	REEN	S		CIL		
			NC 1		A		1	В		С		ITE	M	
NASA IOA	[:	3 /1R 3 /3]	[P] NA]]	1	P]	[P NA]	[]	*
COMPARE	[/N]	[n j	ί	1	1]	[N]	[]	
RECOMMENI	DAT:	IONS:	(If	d:	iffer	ent	fı	com 1	NASA)				
	[:	3 /3]	[NA]	[ì	VA]	ſ	NA		[.DD/DI		ETE)
* CIL RET	rent	CION 1	RATIONA	L	E: (I:	f ap	p]	lical	•					
REMARKS:									I	ADI IDAN	EQUATE EQUATE	[]	
3 TOGGLE POSITION)	SW]	TCHES	THI	S	FMEA	FAI:	LĮ E	JRE E	MODE	(NC	OUTPU	T IN	OF	EN
FEEDLINE ENGINE.	PRI	essuri	RELIE	F	AFTI	ER M	EC	co, v	VILL	EX.	ST THR	OUGH	TH	ΙE

ASSESSMEI ASSESSMEI NASA FME	NT II):	MPS	IPS-402X								SA D BASEL	INE		-	
SUBSYSTEM MDAC ID:	M:		402	•												
LEAD ANA	LYST	•	R.	o'D	MNC	ELL										
ASSESSME	NT:															
CRITICALITY REDUNDANCY SCREENS FLIGHT								CIL								
		W/FU			A			В			С				•	
NASA IOA	[3 [3	/1R /1R]		[P]]	P P]	[P P]		[] *]	:
COMPARE	[/]		[]	[]	(]		[]	
RECOMMEN	DATI	ons:		(If	dif	fer	ent :	fro	om N	ASA))					
	(/]		(]	[]	[]	(Al	[D/DC		E)
* CIL RE	TENT	ION :	RAT:	IONA	LE:	(I	f ap	p1 :	icab			DEQU <i>A</i> DEQU <i>A</i>]	
REMARKS: 12 CLOSE NOT NOTE	RPC	'S. RING	TH TH	IS F E OR	MEA IGI	FA NAL	ILUR	E I	MODE NALY	E (II	NA) •	DVERT	ENT	OUT	PUT)	WAS

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	MPS-403X		NASA DATA: BASELINE NEW]
	EPD&C/MPS 403 CLOSE RPC OUTPUT	DIODE			
LEAD ANALYST:	R. O'DONNELL				
ASSESSMENT:					
CRITICALI FLIGHT		CY SCREENS	3	CIL	ſ
HDW/FUN	NC A	В	С		-
NASA [3 /1R IOA [3 /1R] [P] [] [P]	F] [F] [P] P]	[X]] *
COMPARE [/] [] [] [1	[]
RECOMMENDATIONS:	(If different f	from NASA)			
[/] [] [] [] (AD	[D/DE] LETE)
* CIL RETENTION F	RATIONALE: (If app	olicable)	A DECUL ME		
REMARKS:		IN	ADEQUATE IADEQUATE	[]
12 DIODES. THIS	FMEA FAILURE MODE	E (DIODE S IOA ANALY	SHORT, CURR	ENT	LEAKAGE)

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	1/28/88 MPS-404X 2073-3	NASA DATA: BASELINE NEW								
	EPD&C/MPS 404 CLOSE RPC OUTE	PUT DIODE								
LEAD ANALYST:	R. O'DONNELL									
ASSESSMENT:										
CRITICAL		DANCY SCREI	CIL ITEM							
FLIGH HDW/FU		В	С							
NASA [3 /1R IOA [3 /1R] [P]] [P]	[P] [P]	[P] [P]	[] *						
COMPARE [/] []	[]	[]	[]						
RECOMMENDATIONS:	(If differe	nt from NA	SA)							
[/] []	[]	[] (A	[] .DD/DELETE)						
* CIL RETENTION	RATIONALE: (If	applicabl	e) ADEQUATE INADEQUATE							
NOTED DURING THE	REMARKS: 12 DIODES. THIS FMEA FAILURE MODE (DIODE SHORT TO GND) WAS NOT NOTED DURING THE ORIGINAL IOA ANALYSIS. FAILURE WILL BE									

ASSESSM ASSESSM NASA FM	EN	T I	D:		MI	PS-4	05	x									ASA BASE		Ε [
SUBSYST MDAC ID ITEM:	EM :	:			40				II	I													
LEAD AN	AL	YST	:		R.	01	DO:	NN]	ELL														
ASSESSMI	EN'	T:																					
	C	RIT F	ICA	LI	TY	•		RI	EDUI	ND	AN	CY	S	CRE	EN	S				IL			
								A				В				С			1	TEI	M		
NASA IOA		[3 [3	/1 /1	R R]]	P P]		[F F]		[P P]		[X X]	*	
COMPARE		[/]		[]		[]		[J		[]		
RECOMMEN	ND2	ATI	ons	:		(If	đ	lff	ere	≥nt	: 1	fro	m	NAS	SA)	ŀ							
		[/]		[]		[]		[]	(A		/DE		ETE)
* CIL RE	TI	ENT	ION	R	AT:	IONA	LE	:	(If	: a	pp	oli	.ca	ble	≥)								
REMARKS:															IN		EQUA EQUA]		
12 HDC I FAIL ON) FUNCTION		MO	NO	Τ.	NU.	red	DU	RI	NG	TH	E	OR	TG	:TN2	۱T.	TO	א א א	INTV	CTC	•			
									-417			ד ת	-	TVC		TA D	OMI	コエレア	KE	חחי	NL	ANC	ΙΥ.

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	1/28/88 MPS-406X 2075-2	NASA DATA BASELINE NEW	[]
SUBSYSTEM: MDAC ID: ITEM:	EPD&C/MPS 406 CLOSE HDC I		
LEAD ANALYST:	R. O'DONNELL		
ASSESSMENT:			
CRITICALI FLIGHT		DANCY SCREENS	CIL ITEM
HDW/FU	NC A	ВС	
NASA [3 /1R IOA [3 /1R] [P]] [P]	[F] [P] [F] [P]	[X] *
COMPARE [/] []	[] []	[]
RECOMMENDATIONS:	(If differe	nt from NASA)	
[/] []	[] [] (A	[] DD/DELETE)
* CIL RETENTION	RATIONALE: (If	applicable) ADEQUATE INADEQUATE	

REMARKS:

3 CLOSE HDC Is. THIS FMEA FAILURE MODE (CLOSE HDC I DRIVER FAIL ON) WAS NOT NOTED DURING THE ORIGINAL IOA ANALYSIS. FUNCTIONAL CRITICALITY DETERMINED BY LIKE AND UNLIKE REDUNDANCY.

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	MPS-407X	NASA DATA BASELINE NEW							
SUBSYSTEM: MDAC ID: ITEM:	EPD&C/MPS 407 OPEN RPC								
LEAD ANALYST:	R. O'DONNELL								
ASSESSMENT:									
CRITICALITY REDUNDANCY SCREENS CIT									
HDW/FU		В С	ITEM						
NASA [3 /1R IOA [3 /1R] [P]] [P]	[P] [P] [P] [P]	[] *						
COMPARE [/] []	[] []	[]						
RECOMMENDATIONS:	(If differer	nt from NASA)							
[/] []	[] [] (AI	[] DD/DELETE)						
* CIL RETENTION	RATIONALE: (If	applicable) ADEQUATE INADEQUATE	[]						
REMARKS: 12 OPEN RPCs. THIS FMEA FAILURE MODE (LO2 OPEN PREVALVE RPC "LOSS OF OUTPUT") WAS NOT NOTED DURING THE ORIGINAL IOA ANALYSIS. FUNCTIONAL CRITICALITY DETERMINED BY LIKE AND UNLIKE REDUNDANCY.									

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	MPS-408X			BASELINE NEW	
SUBSYSTEM: MDAC ID: ITEM:	EPD&C/MPS 408 OPEN RPC	OUTPUT D	OIODE		
LEAD ANALYST:	R. O'DONN	ELL			
ASSESSMENT:					
CRITICAL FLIGH	ITY R	EDUNDANC	Y SCREE	NS	CIL ITEM
	NC A		В	С	TIEM
NASA [3 /1R IOA [3 /1R] [P] [F] F]	[P] [P]	[X] *
COMPARE [/] [] [1	[]	[]
RECOMMENDATIONS:	(If dif	ferent f	rom NAS	A)	
[/] [] []	[] (Al	[] DD/DELETE)
* CIL RETENTION	RATIONALE:	(If app) ADEQUATE INADEQUATE	[]
REMARKS: 12 OPEN DIODES. WAS NOT NOTED DU					

CRITICALITY DETERMINED BY LIKE AND UNLIKE REDUNDANCY.

	1/28/88 MPS-409 2077-3	x		NASA DATA BASELINE NEW	
MDAC ID:	EPD&C/M 409 OPEN RP		DIODE		
LEAD ANALYST:	R. 0'DO	NNELL			
ASSESSMENT:					
	ITY	REDUNDA	NCY SCREE	ens	CIL ITEM
FLIGH HDW/FU		A	В	С	IIEM
NASA [3 /1R IOA [3 /1R] [P] P]	[F] [P]	[P] [P]	[X] * []
COMPARE [/] []	[א]	[]	[N]
RECOMMENDATIONS:	(If d	ifferent	from NAS	SA)	
[3 /1R	[P]	[P]		[D] DD/DELETE)
* CIL RETENTION	RATIONAL	E: (If a	pplicable		
				ADEQUATE INADEQUATE	[]
REMARKS: 12 OPEN DIODES. WAS NOT NOTED DU WILL BE REFLECTE	RING THE	ORIGINA	L IOA ANA	ALYSIS. SHO	RTED DIODE

ASSESSME ASSESSME NASA FME	NT I	D:		10)	ζ							DATA ELINE NEW	[x]	
SUBSYSTEMDAC ID:			EPD&C 410 OPEN			[
LEAD ANA	LYST	:	R. 0	DON	INE	ELL										
ASSESSME	NT:															
ı		ICAL:	ITY F		RI	EDUN	IDAN	ICY	SCI	REENS			C:	IL PEN		
	_		NC.		A			В			С					
NASA IOA	[3 [3	/1R /1R]	[[P P]	((F]]	P] P]	٠	[[X X]	*
COMPARE	[/]	[]	(•]	[]		[]	
RECOMMEN	DATI	ons:	(If	đi	ifi	fere	nt	fr	om 1	NASA)						
	C	/]]]	(]	[]	(A	DD,	/DI] ELF	ETE)
* CIL RE	TENT	ION 1	RATION	IALI	ጀ:	(If	aŗ	pl.	icak	•	ADEQ	UATE	[]	
REMARKS: 3 OPEN H NOTED DU DETERMIN	RING	THE	ORIGI	NAI	L]	[OA	ANA	LY	sis.	(DRIV FU	ER F		N)	W	AS	

REPORT DATE 03/11/88 C-353

ASSESSMI ASSESSMI NASA FMI	ENT	ID	:	MPS	3-4113	ζ.					NASA BASE	DATA LINE NEW	[
SUBSYSTEMDAC ID:				411			OCKIN	G I	OIOD	E					
LEAD ANA	ALYS	T:		R.	0 ' DOI	NEI	L								
ASSESSMI	ENT:														
			CAL IGH	ITY T		REL	UNDAN	CY	SCR	EENS	5		CI	L	
				NC		A		В			С				
NASA IOA	[[3	/3 /3]) (NA]	[NA NA	\]	[NA] NA]		[]	*
COMPARE	[/]	[]	[]	[]		ĺ]	
RECOMME	TADI	'IO	ns:	((If d	iff∈	rent	fro	om N	IASA))				
	[/]	[]	[]	[]	(A		DEL.	ETE
* CIL RI	ETEN	ΙΤΙ	ОИ	RAT]	IONALI	E: ([If ap	pli	cab	•	ADEQU NADEQU	ATE	[]	
REMARKS 12 OPEN SHORTED	MDM									FA:	LURE	MODE	(D	IOD	E

	1/28/88 MPS-412X 2181-2			NASA DATA: BASELINE NEW]
D	EPD&C/MPS 412 CLOSE MDM	BLOCKIN	G DIODE			
LEAD ANALYST:	R. O'DONNE	ELL				
ASSESSMENT:						
	ITY RI	EDUNDANC	Y SCREEN	IS	CIL ITEM	1
FLIGH HDW/FU			В	С		
NASA [3 /3 IOA [3 /3] [N2] [N2	A] [A] [NA] [NA] [NA]	[] *
COMPARE [/] [] [] 1	[]	[]
RECOMMENDATIONS:	(If dif:	ferent f	rom NAS	A)		
[/] [] []	[] (A	[D/DD.] ELETE)
* CIL RETENTION	RATIONALE:	(If app) ADEQUATE INADEQUATE	[]
REMARKS: 12 CLOSE MDM BLA SHORTED) WAS NOT	OCKING DIOD T NOTED DUR	ES. THE	S FMEA ORIGINA	FAILURE MOI L IOA ANALY	E (D	IODE

ASSESSM ASSESSM NASA FM	ENT	Ι	D:	MPS	-413					NASA BASE	LINE		x]	
SUBSYST MDAC ID ITEM:				EPD 413 CLO	-		OCKING	DI	ODE					
LEAD AN	ALY	ST	:	R.	0 ' DOI	NNELL								
ASSESSMI	ENT	:												
		F.	LIGI	HT			idancy -					CI	_	
		ועח	W/FC	JNC		A	В	i	(2				
NASA IOA]	3	/3 /3]] [NA] NA]	[N	A] A]	1] 1]	NA] NA]		[) ,	t
COMPARE	[/]	[]	[]	[3		[]	
RECOMMEN	IDA'	ric	ons:	(:	If di	ffere	nt fr	om N	(ASA)					
	[/]	[]	[]	C]	(Al	[DD/E] DELET	'E)
* CIL RE	TEN	T	ОИ	RATIO	ONALE	: (If	appl	icab	le)					
REMARKS:						•			A	DEQU <i>I</i>		[]	
9 CLOSE SHORTS)	MDM	I E	SLOC IOT	KING NOTEI	DIOD DUR	ES.	THIS I	FMEA IGIN	FAIL	URE N A ANA	MODE	(DI	ODE	

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	MPS-414X	NASA DAT BASELIN NE	
SUBSYSTEM: MDAC ID: ITEM:	EPD&C/MPS 414 OPEN SWITCH BI	LOCKING DIODE	.
LEAD ANALYST:	R. O'DONNELL		
ASSESSMENT:			
CRITICAL FLIGH	ITY REDUNI	DANCY SCREENS	CIL ITEM
	NC A	ВС	2-2
NASA [3 /1R IOA [3 /1R	[P] [P]	[P] [P] [F] [P]	[x] *
COMPARE [/] []	[N] [N	[N]
RECOMMENDATIONS:	(If differe	nt from NASA)	
[3 /1F	[P]	[F] [P]	[A] (ADD/DELETE)
* CIL RETENTION	RATIONALE: (If	applicable) ADEQUATI INADEQUATI	E [] E []
REDUNDANCY MASKS	THE FAILURE, OE (DIODE SHORT	S. DIODE FAILS B SCRI AND LACK OF INSTRUMENTS) WAS NOT NOTED DURI	EEN BECAUSE NTATION. THIS

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	MPS-415	x X		NASA DATA BASELINE NEW	
SUBSYSTEM: MDAC ID: ITEM:	415		CKING DIO	DE	.,
LEAD ANALYST:	R. O'DO	NNELL			
ASSESSMENT:					
FLIGH	T		CY SCREEN	s	CIL ITEM
HDW/FU	NC	A	В	С	11011
NASA [3 /1R IOA [3 /1R] [P] [P] [P] [F] [P] P]	[x] *
COMPARE [/] [] [и ј [1	[N]
RECOMMENDATIONS:	(If d	ifferent	from NASA)	
[3 /1R) [P] [F] [P] (AI	[A] DD/DELETE)
* CIL RETENTION	RATIONAL	E: (If ap		3 DEOU3 ME	· .
REMARKS:				ADEQUATE NADEQUATE	[]
12 CLOSE SWITCH MANUAL) IN CLOSI VEHICLE/CREW. F	NG THE LO AILS B SO	02 PREVAL ¹ CREEN BEC	VE COULD I AUSE REDUN	POSSIBLY CA NDANCY MASH	AUSE LOSS OF
FAILURE. THIS F	MEW LWITH	OKE MODE	(DIODE SHO	DKTS) WAS N	NOT NOTED

DURING THE ORIGINAL IOA ANALYSIS.

ASSESSMENT DASSESSMENT INASA FMEA #:	•	16X		NASA DATA BASELINI NEV	
SUBSYSTEM: MDAC ID: ITEM:	EPD&C 416 CLOSE		LOCKING D	IODE	
LEAD ANALYST	: R. O'	DONNELL			
ASSESSMENT:					
	ICALITY	REDUNI	ANCY SCRE	ENS	CIL ITEM
_	LIGHT W/FUNC	A	В	С	
NASA [3 IOA [3	/1R] /1R]	[P] [P]	[F] [F]	[P] [P]	[X] *
COMPARE [/ 1	[]	[]	[]	[]
RECOMMENDATI	ONS: (II	differer	nt from NA	SA)	
ſ	/ 1	[]	[]	[] ([] ADD/DELETE)
* CIL RETENT	TION RATION	NALE: (If	applicabl	e) ADEQUATE	-

REMARKS:

12 CLOSE SWITCH BLOCKING DIODES. LOSS OF ALL REDUNDANCY (GPC AND MANUAL) IN CLOSING THE LO2 PREVALVE COULD POSSIBLY CAUSE LOSS OF VEHICLE/CREW. FAILS B SCREEN BECAUSE REDUNDANCY MASKS THE FAILURE. THIS FMEA FAILURE MODE (DIODE SHORTS) WAS NOT NOTED DURING THE ORIGINAL IOA ANALYSIS.

ASSESSME ASSESSME NASA FME	ENT 1	D:	,	417X				1	NASA DAT BASELIN NE		x]
SUBSYSTE MDAC ID:			417	C/MP		VITCH	Ī				
LEAD ANA	LYSI	: :	B. s	LAUG	HTER						
ASSESSME	NT:										
	F	'ICAL 'LIGH' W/FU	r		REDUI		Y SCR	EENS	•	CI:	
W1 G1		•			-						
NASA IOA		/1R /1R]	[]	5]	[NA] NA]	[E	?] ?]	[] *]
COMPARE	[/]	ſ]	£]	[]	[]
RECOMMEN	DATI	ons:	(I	f di	ffere	ent f	rom N	ASA)			
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* CIL RE								INA	.DEQUATE .DEQUATE]
THIS SWI	TCH	TS NO	JI US	ED DU	RING	NOM:	INAL .	ASCEN	T.		

ASSESSME ASSESSME NASA FME	NT]	[D:		MPS	8/8 5-41 1-2	8 X								SA L SASEI	INE			
SUBSYSTE MDAC ID: ITEM:	M:			418				: SWI	TC	H								
LEAD ANA	LYS	r:		в.	SLA	UG	rhe	ER										
ASSESSME	NT:																	
	CRI'		ALI GHI				RF	EDUNE	AN	CY	SCREE	ENS	3			CII		
			'FUI				A			В			С					
NASA IOA	[3 / 3 /	'1R '1R]		[P P]	[N.	A] A]]	P P]		[]]	*
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RECOMMEN	IDAT	101	1S:		(If	d :	if	ferer	nt	fr	om NAS	SA.)					
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* CIL RI	ETEN	TIC	ON I	RAT	IONZ	λL	E:	(If	ap	pl	icable			DEQU.]	
REMARKS:	: [TCH	I IS	s N	OT	USEI)	BY	THE	CF	EW	DURI	NG	N	OMIN.	AL A	SCE	NT.	

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SUBSYSTI MDAC ID: ITEM:				41	PD&C/ L9 D2 TO			E S	EWI	rC1	H										
LEAD ANA	LY	ST	:	В.	SLA	UG	H	ref	R												
ASSESSME	ENT	:																			
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ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:				NASA DAT BASELIN NE		
	EPD&C/MPS 420 LO2 TOGGL		н			
LEAD ANALYST:	B. SLAUGH	TER				
ASSESSMENT:						
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NASA DATA:

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	MPS-4212	K		NASA DATA: BASELINE NEW	
MDAC ID:	EPD&C/MI 421 BLOCKING		SWITCH		
LEAD ANALYST:	B. SLAUC	GHTER			
ASSESSMENT:					
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HDW/FU		A	В	С	11011
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SUBSYSTEM: MDAC ID: ITEM:	EPD&C/MPS 422 BLOCKING DIOD	E, MDM TO RP	c		
LEAD ANALYST:	B. SLAUGHTER				
ASSESSMENT:					
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ASSESSMENT DATE: 1/28/88 ASSESSMENT ID: MPS-424X NASA FMEA #: 2240-3 SUBSYSTEM: EPD&C/MPS																SA DAT ASELIN		-]	
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ASSESSMENT DATE: 1/28/88 ASSESSMENT ID: MPS-425X NASA FMEA #: 2397-2 SUBSYSTEM: EPD&C/MPS															DAT. ELIN: NE		x]	
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ASSESSMENT DATE: 1/28/88 ASSESSMENT ID: MPS-426X NASA FMEA #: 2397-3 SUBSYSTEM: EPD&C/MPS														ASA DA BASELI N		[x]		
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SUBSYSTEM: MDAC ID: ITEM:	EPD&C 427 DIODE		BLOCK (LC)	7)			
LEAD ANALYST	B. SL	AUGHTER					
ASSESSMENT:							
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LEAD ANA	LYS'	T:	в.	SLAUG	HTER								
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ASSESSME	ENT:																	
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SUBSYSTE MDAC ID:	M:	431	C/MPS E, OP		IDM I	SOLAT	ION					
LEAD ANA	LYST:	B. S	LAUGH	TER								
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LEAD ANALYST:	B. SLAU	JGHT	ER							
ASSESSMENT:										
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SUBSYSTEM: MDAC ID: ITEM:		EPD&C, 433 LO2 IN			LL	& DRA	IN TO	OGGLE S	SWITC	н	
LEAD ANALY	ST:	B. SL	AUGH	TER							
ASSESSMENT	:										
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ASSESSMENT DATE: 1/15/88 ASSESSMENT ID: MPS-434 NASA FMEA #: 2281-2 SUBSYSTEM: EPD&C/M														ASA DA BASEL:		[]	
SUBSYSTE MDAC ID: ITEM:	M:			43	4			OPE	N	sw	BLO	CK	(MC	DULE)				
LEAD ANA	LYS	ST	:	в.	SLA	Œ	HT	ER											
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ASSESSME	NT	:																		
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ASSESSMENT DATE: 1/14/88 ASSESSMENT ID: MPS-436X NASA FMEA #: 2283-2 SUBSYSTEM: EPD&C/MPS															ASA BASE		E []]	
SUBSYSTEM MDAC ID:	:			43	6			, (OPEI	N	SW	ГВ	SLOCK	В	(LC	A)					
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SUBSYSTE MDAC ID:		4	EPD&C/M 137 DIODE'(FA1 l	MDM BL	оск			
LEAD ANA	LYST:	I	3. SLAU	GHTER						
ASSESSME	NT:									
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SUBSYSTE MDAC ID:	M:			438			FA4	MI	OM BI	оск							
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SUBSYSTEM MDAC ID:	1 :	440	C/MPS E (3A), F.	A2 MDM BLC	OCK		
LEAD ANA	LYST:	B. S	LAUGHTER				
ASSESSME	NT:						
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ASSESSMENT DATE: 1/20/88 ASSESSMENT ID: MPS-443X NASA FMEA #: 2246-1														ASA BASE] :	x]	
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LEAD ANA	LYS	T:	B. SL	AUGH	TER						
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SUBSYSTEM: MDAC ID: ITEM:	EPD&C/MPS 445 HYBRID DRIVER,	TYPE 3, CL								
LEAD ANALYST:	B. SLAUGHTER									
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ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	1/20/88 MPS-449X 2251-3		NASA DATA: BASELINE NEW	[x]
SUBSYSTEM: MDAC ID: ITEM:	EPD&C/MPS 449 DIODE (12A)	, CL XOVER		
LEAD ANALYST:	B. SLAUGHTE	ER		
ASSESSMENT:				
CRITICAL		DUNDANCY SCREEN	S	CIL ITEM
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ASSESSME	NT:												
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ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	MPS-455X	NASA DATA: BASELINE NEW	
MDAC ID:	EPD&C/MPS 455 DIODE CL RPC "C" OU	Г (12А)	
LEAD ANALYST:	B. SLAUGHTER		
ASSESSMENT:			
CRITICAL FLIGHT	r	SCREENS	CIL ITEM
HDW/FU	NC A B	С	
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RECOMMENDATIONS:	(If different from	n NASA)	
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LEAD ANA	LYST	:	в. 8	SLAUG	HTER							
ASSESSME	NT:											
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SUBSYSTEM MDAC ID: ITEM:		EPD&C/M 458 TRANSIE		SUPPE	RESS	SION 1	DIOI	ŒS	;				
LEAD ANA	LYST:	B. SLAU	GHT	TER									
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SUBSYSTEM: MDAC ID: ITEM:	EPD&C/MPS 459 ZENER DIODES	1			
LEAD ANALYST:	B. SLAUGHTER	1			
ASSESSMENT:					
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ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	1/26/88 MPS-460X 2032-1			NASA DATA BASELINE NEW	
	EPD&C/MPS 460 HDC I-REL	AY CONTE	OL PWR		
LEAD ANALYST:	B. SLAUGH	rer			
ASSESSMENT:					
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SUBSYSTEM: EPD&C/MPS MDAC ID: 461 ITEM: HDC I-RELAY CONTROL PWR LEAD ANALYST: B. SLAUGHTER ASSESSMENT: CRITICALITY REDUNDANCY SCREENS CIL ITEM HDW/FUNC A B C NASA [2 /1R] [P] [F] [P] [X] * IOA [3 /1R] [P] [F] [P] [X] * COMPARE [N /] [] [] [] [] [] [] [] [] []	ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	MPS-461X		NASA DA BASELI N						
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REMARKS: THE IOA SCEN	ARIO	IS MOR	Œ	CI	RITICA	ΑL	•								

ASSESSMENT DATE ASSESSMENT ID: NASA FMEA #:	: 2/02/88 MPS-467X 2091-2		NASA DATA BASELINI NEV	
SUBSYSTEM: MDAC ID: ITEM:	EPD&C/MPS 467 CL HDC I			
LEAD ANALYST:	B. SLAUGHT	ER		
ASSESSMENT:				
CRITICA: FLIG		DUNDANCY SCRI	EENS	CIL ITEM
HDW/F	JNC A	В	С	11111
NASA [3 /3 IOA [2 /1]] [NA	[NA]] [F]	[NA] [P]	[] * [X]
COMPARE [N /N] [N] [N]	[N]	[N]
RECOMMENDATIONS	(If diff	erent from NA	ASA)	
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* CIL RETENTION	RATIONALE:	(If applicabl	ADEQUATE	
REMARKS: THE IOA SCENARIO	TS MODE CD	TTTCXT	INADEQUATE	[]

ASSESSMENT ID: NASA FMEA #:	MPS-468			BASELINE NEV	
SUBSYSTEM: MDAC ID: ITEM:	EPD&C/M 468 CL RPC	iPS			
LEAD ANALYST:	B. SLAU	GHTER			
ASSESSMENT:					
CRITICAI FLIGH HDW/FU	T	REDUNDA A	ANCY SCRE	ENS C	CIL ITEM
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COMPARE [N /N] [N]	[N]	[N]	[N]
RECOMMENDATIONS:	(If d	lifferent	from NA	SA)	
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* CIL RETENTION REMARKS:		•		e) ADEQUATE INADEQUATE	
THE IOA SCENARIO) IS MORE	CRITICA	AL.		

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	2/03/88 MPS-469X 2092-2	NASA DATA BASELINI NEV	
	EPD&C/MPS 469 CL RPC		•
LEAD ANALYST:	B. SLAUGHTER		
ASSESSMENT:			
CRITICAL FLIGH HDW/FU	T	ANCY SCREENS B C	CIL ITEM
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COMPARE [N /N] [N]	[N] [N]	[и]
RECOMMENDATIONS:	(If different	t from NASA)	
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THE IOA SCENARIO IS MORE CRITICAL.

ASSESSME ASSESSME NASA FME	NT ID:	2/03/88 MPS-4703 2094-3	ĸ	NASA DATA: BASELINE [] NEW [X]							
SUBSYSTE MDAC ID:	M:	EPD&C/MI 470 CL RPC I		JT DIODE							
LEAD ANA	LYST:	B. SLAU	SHTER								
ASSESSME	NT:										
	CRITICAL FLIGH HDW/FU	T	REDUNI A	DANCY SCRI	eens C		CIL ITEM				
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COMPARE	[/] []	[]	[]	[]				
RECOMMEN	DATIONS:	(If d	iffere	nt from N	ASA)						
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* CIL RE	TENTION	RATIONAL	E: (If	applicab	le) ADEQUATE INADEQUATE	-]				

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	2/03/88 MPS-471X 2095-3		1	NASA DATA: BASELINE NEW	[x]	
SUBSYSTEM: MDAC ID: ITEM:	EPD&C/MPS 471 XOVER DIO							
LEAD ANALYST:	B. SLAUGH	TER						
ASSESSMENT:								
CRITICAI FLIGH HDW/FU	T	EDUNDANCY B		c	CI	[L PEM	ſ	
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	EPD&C/MPS 472 CL RPC C OUTPU	JT DIODE	
LEAD ANALYST:	B. SLAUGHTER		
ASSESSMENT:			
CRITICAL: FLIGHT HDW/FUI	T	DANCY SCREENS B C	CIL ITEM
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COMPARE [/] []	[и] [и]	[]
RECOMMENDATIONS:	(If differen	nt from NASA)	
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* CIL RETENTION	RATIONALE: (If	applicable) ADEQUAT INADEQUAT	

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SUBSYSTI MDAC ID: ITEM:				473		PS MONITO	R RI	ESISTO	R			
LEAD AND	ALY	ST	:	В.	SLAU	GHTER						
ASSESSMI	ENT	:										
	CR		ICAL LIGH	ITY T		REDUN	DANG	CY SCR	EENS	5	CIL	
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SUBSYSTEM MDAC ID: ITEM:			EPD&C/ 474 LOCK F		(2)						
LEAD ANAL	YST:	;	B. SLA	UGHI	TER						
ASSESSMEN	T:										
C			TY	RI	EDUND <i>i</i>	NCA	SCR	EENS		CIL	1
FLIGHT HDW/FUNC				A	A B					1111	•
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SUBSYSTEM: MDAC ID: ITEM:	EPD&C/ 475 LOCK I					
LEAD ANALYST:	B. SL	AUGHTER				
ASSESSMENT:						
	CALITY LIGHT	REDUNI	DANCY SCRI	EENS	CIL	
HDW	/FUNC	A	В	С		
NASA [3 IOA [3	/1R] /1R]	[P] [P]	[P] [P]	[P] [P]]] *]
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RECOMMENDATIO	ONS: (If	differen	nt from NA	ASA)		
Ţ	/ 1	[]	[]	[] ([ADD/D] ELETE)
* CIL RETENTI	ON RATIONA	ALE: (If	applicabl	le) ADEQUATE INADEQUATE		
REMARKS: NASA FMEA NO THAT THIS ITE	05-6J-2340 EM FAILS SO)-2 REV 1 CREEN B.	.0/10/87 (THIS TEX	CONTAINS TEX	T EXP	LAININ

ASSESSMENT DA ASSESSMENT ID NASA FMEA #:	: MPS-47	76X		NASA DA BASELI N	TA: NE [] EW [X]
SUBSYSTEM: MDAC ID: ITEM:	EPD&C, 476 UNLOC	/MPS K RPC (2)			
LEAD ANALYST:	B. SL	AUGHTER			
ASSESSMENT:					
FI	CALITY		DANCY SCR	EENS C	CIL ITEM
HDW	/FUNC	A	В	C	
NASA [3 IOA [3	/1R] /1R]	[P] [P]	[P] [P]	[P] [P]	[] *
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REMARKS: NASA FMEA NO THAT THIS IT	05-6J-234 EM FAILS S	1-1 REV :	10/10/87 THIS TE	CONTAINS TE	EXT EXPLAININ

ASSESSMENT DATE: 2/11/88 ASSESSMENT ID: MPS-477X NASA FMEA #: 2341-2									DATA SELINE NEW]
SUBSYSTE MDAC ID:			EPD&C 477 UNLOC	•)					
LEAD ANALYST: B. SLAUGHTER											
ASSESSME	NT:										
		FLIGH	_					REENS		CIL	
	H	DW/FU	NC	A	•		В	С			
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COMPARE	ſ	/]	[]	[]	[]		[]
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REMARKS:								ADEQ INADEQ	UATE UATE	[]
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ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	MPS-478X			BASELIN NE	
	EPD&C/MPS 478 LOCK HDC				
LEAD ANALYST:	B. SLAUGH	HTER			
ASSESSMENT:					
CRITICAL FLIGH		REDUNDA	ANCY SCRE	ENS	CIL ITEM
HDW/FU		A	В	С	
NASA [3 /1R IOA [3 /1R] []	P] P]	[P] [P]	[P] [P]	[] *
COMPARE [/] [1	[]	[]	[]
RECOMMENDATIONS:	(If di	fferen	t from NA	ASA)	
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* CIL RETENTION	RATIONALE	: (If	applicabl	.e) ADEQUATE INADEQUATE	
REMARKS: NASA FMEA NO 05- THAT THIS ITEM F	6J-2342-1 AILS SCRE	REV 1	0/10/87 (THIS TEX	CONTAINS TEX	KT EXPLAINING E DELETED.

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SUBSYSTEM: MDAC ID: ITEM:		EPD&C, 479 LOCK I											
LEAD ANALYST: B. SLAUGHTER													
ASSESSMENT:													
CRITICALITY REDUNDANCY SCREENS CIL FLIGHT ITEM													
HDW/FUNC				A B				C					
NASA [3 IOA [3	/1R /1R]	[P]	[P P]	[P]	[]	*	
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RECOMMENDATI	ons:	(If	dif	feren	t f	rc	m NA	SA)					
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* CIL RETENT	ION I	RATIONA	LE:	(If	app:	li	.cabl						
REMARKS:									DEQUATE DEQUATE]		
NASA FMEA NO 05-6J-2342-2 REV 10/10/87 CONTAINS TEXT EXPLAINING THAT THIS ITEM FAILS SCREEN B. THIS TEXT SHOULD BE DELETED.													

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	MPS-480	x		BASELIN	
SUBSYSTEM: MDAC ID: ITEM:	EPD&C/M 480 UNLOCK				
LEAD ANALYST:	B. SLAU	GHTER			
ASSESSMENT:					
CRITICAI FLIGH		REDUND	ANCY SCR	EENS	CIL ITEM
HDW/FU		A	В	С	
NASA [3 /1F IOA [3 /1F	?] [?] [P] P]	[P] [P]	[P] [P]	[] *
COMPARE [/] [1	[]	[]	[]
RECOMMENDATIONS	(If d	ifferen	t from N	(ASA)	
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* CIL RETENTION	RATIONAL	E: (If	applicab	ole) ADEQUAT INADEQUAT	E [] E []
REMARKS: NASA FMEA NO 05- THAT THIS ITEM	-6J-2343- FAILS SCR	1 REV 1 REEN B.	0/10/87 THIS TE	CONTAINS TE	XT EXPLAININ E DELETED.

ASSESSME	ASSESSMENT DATE: 2/11/88 ASSESSMENT ID: MPS-481X NASA FMEA #: 2343-2										ASA DAT BASELII NI	NE.	: [[x]		
SUBSYSTE MDAC ID:			EPD&C 481 UNLOC			C I											
LEAD ANA	LYST	':	B. SL	AUG:	нт	ER											
ASSESSME	NT:																
	F	ICAL LIGH W/FU	r	•		EDUNI	DAN(CY B	SCRE	EN	s c			CI	L	I	
NASA IOA		•]	[]	P P]]	P P]	[P P]		[]	*
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NASA FMEA NO 05-6J-2343-2 REV 10/10/87 CONTAINS TEXT EXPLAINING THAT THIS ITEM FAILS SCREEN B. THIS TEXT SHOULD BE DELETED.

ASSESSME ASSESSME NASA FME	NT I	D:	2/11/ MPS-4 2344-	827	K							SA DATA BASELINI NEV		x]	
SUBSYSTE MDAC ID:			EPD&C 482 LOCK			III	(2)									
LEAD ANA	LYST	:	B. SL	AUG	GH?	rer										
ASSESSME	NT:															
		CICAL			RI	EDUN	DAN	CY	SCRE	EN:	S			IL TEI		
		W/FU			A			В			С					
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REMARKS:																				

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	2/11/88 MPS-484X 2345-1		NASA DATA: BASELINE NEW	
SUBSYSTEM: MDAC ID: ITEM:	EPD&C/MPS 484 UNLOCK HDC III	(2)		
LEAD ANALYST:	B. SLAUGHTER			
ASSESSMENT:				
CRITICAL FLIGH HDW/FU	T	ANCY SCREENS	s C	CIL ITEM
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RECOMMENDATIONS:	(If different	t from NASA)	
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ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	2/11/88 MPS-485X 2345-2			NASA DATA BASELINE NEW	= =
SUBSYSTEM: MDAC ID: ITEM:	EPD&C/MPS 485 UNLOCK HD)		
LEAD ANALYST:	B. SLAUGH	TER			
ASSESSMENT:					
CRITICAL: FLIGH		EDUNDANC	Y SCREE	ens	CIL ITEM
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ASSESSMENT DA ASSESSMENT ID NASA FMEA #:		87X		NASA DA BASELI N	
SUBSYSTEM: MDAC ID: ITEM:	EPD&C, 487 LOCK		TPUT DIOD	E	
LEAD ANALYST:	B. SL	AUGHTER			
ASSESSMENT:					
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ASSESSMENT ASSESSMENT NASA FMEA	r ID	:	MPS-4	88X								SA DAT ASELIN NI	ΙE]	
SUBSYSTEM: MDAC ID: ITEM:			EPD&C 488 LOCK			OUT	PU'I	· E	OIOD	E						
LEAD ANALY	YST:		B. SL	AUG:	нт	ER										
ASSESSMEN'	T:															
CI	ASSESSMENT: CRITICALITY REDUNDANCY SCREENS CIL FLIGHT ITEM HDW/FUNC A B C															
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COMPARE	[/]	[]	(]	[]		[]	
RECOMMEND	ATIC	ns:	(If	di	fſ	feren	t i	fro	om N	(ASA))					
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SUBSYSTE MDAC ID:				EPD&C/ 491 UNLOCI			сво	UT:	PU'	r DI	ODE					
LEAD ANA	LYS	T	:	B. SL	\UG	H	rer									
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CRITICALITY REDUNDANCY SCREENS CIL FLIGHT ITEM HDW/FUNC A B C																
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COMPARE	[/]	[]	ĺ]	[]		[]	
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LEAD ANA	LYS	ST	}	B. S	LAUG	TH	ER											
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SUBSYSTEMDAC ID:	M:		EPD&C/ 493 LOCK F			R DI	ODE						
LEAD ANA	LYST:		B. SL	AUGH	ITER								
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	2/12/88 MPS-494X 2348-3			NASA DATA BASELINE NEW		
	EPD&C/MPS 494 LOCK RPC X	OVER I	DIODE			
LEAD ANALYST:	B. SLAUGHT	ER				
ASSESSMENT:						
CRITICAL: FLIGH		EDUNDA	NCY SCREE	ens	CIL ITEM	
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SUBSYSTEM: MDAC ID: ITEM:	EPD&C/MPS 495 UNLOCK RPC XOV	/ER DIODE		
LEAD ANALYST:	B. SLAUGHTER			
ASSESSMENT:				
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HDW/FUN	IC A	В	С	
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LEAD ANA	LYS	T:	в.	SLAUGH	ITER							
ASSESSME	NT:											
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	2/12/88 MPS-4983 2350-1	K		NASA DATA BASELINE NEW	
SUBSYSTEM: MDAC ID: ITEM:	EPD&C/MI 498 TRANSIE		RESSOR DIC	DDES (2)	
LEAD ANALYST:	B. SLAU	GHTER			
ASSESSMENT:					
CRITICAL FLIGH		REDUND	ANCY SCREE		CIL ITEM
HDW/FU	NC	A	В	С	
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* CIL RETENTION REMARKS:	RATIONAL	E: (If	applicabl	e) ADEQUATE INADEQUATE	
REF: MPS-498X.					

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	MPS-499X		NASA DATA BASELINI NEV	
SUBSYSTEM: MDAC ID: ITEM:	EPD&C/MPS 499 UNLOCK POS S	W MONITOR R	ESISTORS (2)	ı
LEAD ANALYST:	B. SLAUGHTER			
ASSESSMENT:				
CRITICAL: FLIGHT	ITY REDU	NDANCY SCRE	ENS	CIL
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COMPARE [/N] [N]	[N]	[N]	[]
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ONLY AVAIL REF: M FAILURE CAUSES A	IPS/EPDC FMEA LOSS OF MONI	REVIEW SUMI	MARY 8-17-87 BILITY.	. THE

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SUBSYSTEM: MDAC ID: ITEM:	EPD&C 501 RPC A		WR MON RE	SISTORS (6)		
LEAD ANALYST:	B. SL	AUGHTER				
ASSESSMENT:						
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* CIL RETENTION REMARKS:	ON RATION	ALE: (If	applicabl	Le) ADEQUATE INADEQUATE		

ASSESSMENT DATE: 2/12/88 ASSESSMENT ID: MPS-502X NASA FMEA #: 2376-1														ASA I BASEI		[]	
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LEAD ANALYST: B. SLAUGHTER																			
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ASSESSMENT DATE: 2/12/88 ASSESSMENT ID: MPS-505X NASA FMEA #: 2377-1 SUBSYSTEM: EPD&C/MPS															ASA DA BASELI N		[x]	
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ASSESSME ASSESSME NASA FME	NT	ID:	MPS	12/88 5-5071 77-3	NASA DATA: BASELINE [] NEW [X]											
SUBSYSTE MDAC ID:			507	SOCK I		c c	OUT	'PU'	T I	DIODE						
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ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	MPS-601	DASELINE [] NEW [X]							
	EPD&C/N 601 TOGGLE								
LEAD ANALYST:	B. SLAU	JGHTER							
ASSESSMENT:									
CRITICAI FLIGH		REDUND	ANCY SCRE	ENS	CIL				
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ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:		\$			TA: NE [] EW [X]	
SUBSYSTEM: MDAC ID: ITEM:	EPD&C/MF 602 TOGGLE S					
LEAD ANALYST:	B. SLAUG	HTER				
ASSESSMENT:						
CRITICAL FLIGH		REDUND	ANCY SCR	EENS	CIL ITEM	
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ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:				NASA DATA: BASELINE NEW								
SUBSYSTEM: MDAC ID: ITEM:	EPD&C/MPS 603 TOGGLE SV											
LEAD ANALYST:	B. SLAUGH	HTER										
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ONLY AVAIL REF: M	MARKS: LY AVAIL REF: MPS/EPDC FMEA REVIEW SUMMARY 8-17-87. THE TOGGLE ITCH IS NOT USED AT MECO.											

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	2/15/88 MPS-604 2168-1	x		NASA DATA: BASELINE NEW]
SUBSYSTEM: MDAC ID: ITEM:	EPD&C/M 604 CIRCUIT	PS BREAKER				
LEAD ANALYST:	B. SLAU	GHTER				
ASSESSMENT:						
CRITICAI FLIGH		REDUNDAN	CY SCREEN	ıs	CIL ITEM	I
HDW/FU		A	В	С		
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SUBSYSTEM MDAC ID:	M:		EPD& 606 SW S	•	S RESIS	ror							
LEAD ANA	LYST	':	B. S	LAUG	HTER								
ASSESSME	NT:												
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LEAD ANA	LYS	ST	:	в.	SL	\U(GHT	rer												
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ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	MPS-616X	PS-616X BASELINE [] 165-2 NEW [X]									
SUBSYSTEM: MDAC ID: ITEM:	EPD&C/MPS 616 TOGGLE SWITCH	ſ									
LEAD ANALYST:	B. SLAUGHTER										
ASSESSMENT:											
CRITICAL	ITY REDUN	DANCY SCREENS	CIL								
FLIGH HDW/FU	NC A	В С	ITE	iM							
NASA [3 /1F IOA [3 /3	[P]] [NA]	[P] [P] [NA] [NA]]] *]							
COMPARE [/N] [N]	[и] [и]	[]							
RECOMMENDATIONS:	(If differe	ent from NASA)									
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* CIL RETENTION	RATIONALE: (If	,									
		ADEQUATE INADEQUATE]							
REMARKS: ONLY AVAIL REF: MPS/EPDC FMEA REVIEW SUMMARY 8-17-87. NASA USES A FAILURE UNRELATED TO THE SWITCH TO CAUSE AN ABORT. THE ABORT CRITICALITY IS 2/1R.											

ASSESSMENT DASSESSMENT INASA FMEA #:	D: M	/15/88 PS-617% 165-3	\$		NASA DAT BASELIN NE						
SUBSYSTEM: MDAC ID: ITEM:	6:	PD&C/MI 17 OGGLE S									
LEAD ANALYST	: B	. SLAUC									
ASSESSMENT:											
F	ICALIT			ANCY SCRE		CIL ITEM					
HD	W/FUNC		A	В	С						
NASA [3 IOA [3	/1R] /3]	[P] NA]	[P] [NA]	[P] [NA]	[]	*				
COMPARE [/N]	[N]	[и]	[N]	[]					
RECOMMENDATI	ons:	(If d	ifferen	nt from NA	SA)						
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* CIL RETENT	'ION RA	LIANOIT	E: (If	applicabl	e) ADEQUATI INADEQUATI]]				
DEMADKS.											

ONLY AVAIL REF: MPS/EPDC FMEA REVIEW SUMMARY 8-17-87. NASA USES A FAILURE UNRELATED TO THE SWITCH TO CAUSE AN ABORT. THE ABORT CRITICALITY IS 2/1R.

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	MPS-618X		NASA DA BASELI N		
SUBSYSTEM: MDAC ID: ITEM:	EPD&C/MPS 618 TOGGLE SWIT	СН			
LEAD ANALYST:	B. SLAUGHTE	R			
ASSESSMENT:					
CRITICAL: FLIGHT	ITY RED	UNDANCY SCR	EENS	CII ITI	
HDW/FUI	NC A	В	С		
NASA [3 /1R IOA [3 /3] [P]] [NA]	[P] [NA]	[P] [NA]	[] *]
COMPARE [/N] [N]	[N]	[N]	[]
RECOMMENDATIONS:	(If diffe	rent from NA	ASA)		
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* CIL RETENTION I	RATIONALE: (If applicabl			
REMARKS:			ADEQUAT: INADEQUAT:	E []
ONLY AVAIL REF: ANALYSIS IS FOR	MPS/EPDC FM	EA REVIEW SU	JMMARY 8-17	-87.	NASA'S

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	MPS-619	ζ.		NASA DATA: BASELINE NEW									
	EPD&C/MI 619 FUSE	PS											
LEAD ANALYST:	B. SLAU	SHTER											
ASSESSMENT: CRITICALITY REDUNDANCY SCREENS CIL													
CRITCALII REBURBIRGI DOLLEGO													
HDW/FU		A	В	С	ITEM								
NASA [3 /1F IOA [3 /3] [P] NA]	[P] [NA]	[P] [NA]	[] *								
COMPARE [/N] [N]	[N]	[N]	[]								
RECOMMENDATIONS:	(If d	ifferen [.]	t from NAS	SA)									
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* CIL RETENTION	RATIONAL	E: (If	applicable	e) ADEQUATE INADEQUATE	[]								
REMARKS: ONLY AVAIL REF: ANALYSIS IS FOR	MPS/EPDC	FMEA R	EVIEW SUMM	MARY 8-17-87	. NASA'S								

ASSESSMENT ASSESSMENT NASA FMEA	ID:	NASA DATA BASELINE NEW											
SUBSYSTEM: MDAC ID: ITEM:		EPD&C/M 620 FUSE	PS										
LEAD ANALY	ST:	B. SLAU	GHTER										
ASSESSMENT: CRITICALITY REDUNDANCY SCREENS CIL													
CR	CIL												
	FLIGHT HDW/FUI	ITEM											
NASA [IOA [3 /1R 3 /3] [P] [[P] [NA]	[X] * []								
COMPARE [/N] [и ј [и]	[N]	[N]							
RECOMMENDA	TIONS:	(If d	ifferent	from NA	SA)								
נ	3 /3] [NA] [NA]		[D] DD/DELETE)							
* CIL RETE	NTION E	RATIONAL	E: (If ap	plicable	e)								
					ADEQUATE INADEQUATE								
ANALYSIS I	S FOR A CONTRO	AN ABORT. DL IS INI	. THE MA	NUAL SHO	MARY 8-17-87 UTDOWN CAPAB NGINE HELIUM	. NASA'S ILITY IS USED							

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	NASA DATA BASELINE NEW											
SUBSYSTEM: MDAC ID: ITEM:	тсн											
LEAD ANALYST:												
ASSESSMENT:												
CRITICAL	CIL ITEM											
FLIGH HDW/FU		в с	TILM									
NASA [3 /1R IOA [3 /3] [P]] [NA]	[F] [P] [NA] [NA]	[X] * []									
COMPARE [/N] [N]	[N] [N]	[N]									
RECOMMENDATIONS:	(If differen	it from NASA)										
[3 /3] [NA]	[NA] [NA] (A	[D] DD/DELETE)									
* CIL RETENTION	RATIONALE: (If	applicable) ADEQUATE INADEQUATE	[]									

ONLY AVAIL REF: MPS/EPDC FMEA REVIEW SUMMARY 8-17-87. NASA'S ANALYSIS IS FOR AN ABORT. THE MANUAL SHUTDOWN CAPABILITY IS USED WHEN LIMIT CONTROL IS INHIBITED AND AN ENGINE HELIUM SHUTDOWN LIMIT VIOLATION OCCURS (I.E., ABORT CASE).

ASSESSMENT DATE: 2/15/8 ASSESSMENT ID: MPS-62 NASA FMEA #: 2171-2							x									ASA DAT BASELII NI	NE	[x			
SUBSYSTE MDAC ID:				62				N S	WIT	CI	H											
LEAD ANA	LY	ST	:	в.	SL	AU	GH'	ref	2													
ASSESSMENT:																						
		RI	EDU	INDA	NO	CY	s	CREE	ENS	3				IL Pen								
]		LIGH' W/FU				A				В				С			1.	LEI	1		
NASA IOA	[3 2	/1R /1R]		[P P]		[F P]		[P P]]	x x]	*	
COMPARE	[N	/]		E]		(N]		[]		[]		
RECOMMEN	DA:	ri(ons:		(If	d:	if1	fer	ent	1	fro	m	NAS	A))							
	(2	/1R]		[P]		[P]		[P				/DE		ETE)	
* CIL RE	TEI	NT]	ION I	RAT:	ION	\L	Ξ:	(I	fap	pr	l i	.ca	ble	:)	ΑI	EOUATE	:	ſ		1		
INCONSIS	* CIL RETENTION RATIONALE: (If applicable) ADEQUATE [] INADEQUATE [] REMARKS: ONLY AVAIL REF: MPS/EPDC FMEA REVIEW SUMMARY 8-17-87. NASA ASSUMES THE FAILURE OF A SINGLE WIPER WITHIN THE SWITCH. THIS IS INCONSISTENT WITH PRIOR DEFINITIONS OF THIS FAILURE MODE. IOA ASSUMES PREMATURE CLOSURE OF THE SWITCH.																					

ASSESSMEN ASSESSMEN NASA FME	NТ	ID:	MPS- 222	-625X					BASELIN				
SUBSYSTEM MDAC ID:	M:		EPD 625 ALL			PEN	CMD H	DC					
LEAD ANA	LYS	T:	В.	SLAUG	HTER								
ASSESSME	NT:												
	CRI		LITY	:	REDUN	DANC	Y SCR	EENS	;		CIL		
	H	FLIG IDW/F	UNC UNC		A		В		С	_			
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COMPARE	[/)	ĺ	3	[]	[]	ļ]	
RECOMMEN	DA'I	CIONS	: (If di	ffere	ent :	from N	ASA)	ı				
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								11	NADEQUAT	c	L	1	

ASSESSMENT DATE: 2/17/88 ASSESSMENT ID: MPS-626X NASA FMEA #: 2226-2																A DA SELI		[x]	
SUBSYSTEM: EPD&C/MPS MDAC ID: 626 ITEM: ALL ECO SIM C LEAD ANALYST: B. SLAUGHTER									OPE	N (CMD	HDC	:								
LEAD ANA	LY	ST	:	в.	SL	AU	GH'	rer													
ASSESSME	ENT	:																			
		EDU	NDA			CREE	:NS						IL PEN	4							
	j	HDI	W/FU	NC			A			I	3			С							
NASA IOA		3 3	/1R /1R]		[P P]		[]	F]		[P P]			[X X]	*
COMPARE	[/]		[]		[]		[]			[]	
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ASSESSME ASSESSME NASA FME	II	ATE:	MPS	7/88 -627 7 - 1	C]	NASA D BASEL		[
SUBSYSTE MDAC ID:	M:			627		es sim d	RY C	MD HD	С				
LEAD ANA	LYS	ST	:	В.	SLAU	HTER							
ASSESSME	NT:	:											
		ICAL LIGH	ITY T		REDUN						CIL		
	I	HDI	/FU	NC		A		В		С			
NASA IOA	[3	/3 /3]	[NA] NA]	[NA] NA]	[NA] NA]		[]. *
COMPARE	[/]	[]	[]	(]		[]
RECOMMEN	DA'	ΓI	ons:	:	(If d	iffere	ent f	rom N	IASA)				
	[/]	[]	[]	[]	(A	[DD/E] DELETE)
* CIL RE	TE	NT	ION	RAT	IONAL	E: (If	f app	licab		ADEQUA		[]

ASSESSMENT DATE ASSESSMENT ID: NASA FMEA #:	MPS-628				DATA: CLINE [] NEW [X]
SUBSYSTEM: MDAC ID: ITEM:	EPD&C/M 628 ALL ECO		RY CMD H	DC	
LEAD ANALYST:	B. SLAU	GHTER			
ASSESSMENT:					
CRITICA FLIG	LITY łT	REDUNI	DANCY SC	REENS	CIL ITEM
HDW/F	JNC	A	В	C	2.2
NASA [3 /11 IOA [3 /11	?] [?] [P] P]	[F] [F]	[P] [P]	[X] *
COMPARE [/] []	[]	[]	[]
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[/] []	[]	[]	[] (ADD/DELETE)
* CIL RETENTION REMARKS:	RATIONAL	E: (If	applical	ADEQU	ATE [] ATE []
ONLY AVAIL REF:	MPS/EPDS	FMEA F	REVIEW ST	JMMARY 8-1	7-87.

ASSESSMEI ASSESSMEI NASA FME	T	ID		MPS	7/88 -629 8-1	x						NASA DAT BASELIN NE	E	[[x		
SUBSYSTEMDAC ID:	M:			629	O&C/M O SIM		ET CI	MD :	1-	4 HD0	3					
LEAD ANA	LYS	ST:	:	в.	SLAU	GH'	TER									
ASSESSME	NT	:														
	CR			YTI		R	EDUN	DAN	CY	SCR	EENS	}		CIL		
	1		LIGH N/FU			A			В	}		С				
NASA IOA	[3	/3 /3]	{	N N	A] A]]	N N	A] A]	[NA] NA]		[]	*
COMPARE	[/	3	ļ	[]	[]	[]		[]	
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ASSESSM	ASSESSMENT DATE: 2/17/88 ASSESSMENT ID: MPS-630X VASA FMEA #: 2228-2 SUBSYSTEM: EPD&C/MPS															A DA' SELII N			x]	
SUBSYSTI MDAC ID: ITEM:				63					CMD)]	L –	4 H	DC								
LEAD ANA	ALY.	ST	:	В.	SL	\U	GH'	ΓE	R												
ASSESSME	ENT	:																			
	CR		ICAL LIGH		?		R	EDī	JNDA	NC	Y	SC	REEN	S				CI: IT:		,	
	1	HDV	W/FU	NC			A				В			С			4	L I .	CM	1	
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COMPARE	[/]		[]		(]	[]		(]	
RECOMMEN	DA'	ric	ons:		(If	di	Ĺfí	er	ent	f	rc	om 1	Vasa)	ļ							
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* CIL RE													IN	AL	EQU	JATE JATE	Ĩ		:]	
ONLY AVA	IL	RE	F: 1	IPS,	/EPD	С	FM	EA	REV	/I	EW	su	MMAR	Y	8-1	L7 - 8	7.				

ASSESSMENT ID: NASA FMEA #:		B LX		NASA DATA BASELINE NEW	
SUBSYSTEM: MDAC ID: ITEM:	EPD&C/N 631 LVL SEN		OPEN CMD	HDC	
LEAD ANALYST:	B. SLA	JGHTER			
ASSESSMENT:					
	CALITY IGHT	REDUNDA	NCY SCRE	ENS	CIL ITEM
	FUNC	A	В	С	
NASA [3]	/3] /3]	[NA] [NA]	[NA] [NA]	[NA] [NA]	[] *
COMPARE [/]	[]	[]	[]	[]
RECOMMENDATIO	NS: (If	different	from NA	SA)	
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ASSESSME ASSESSME NASA FME	NT	I	D:	MP	7/17/88 NASA DATA: IPS-632X BASELINE [2229-2 NEW [[x]					
SUBSYSTE MDAC ID:				63				R S	IM	OI	PEI	N CI	MD H	DC					
LEAD ANA	LY	ST	:	в.	SL	AU	GH!	rer											
ASSESSME	NT:	:																	
		Fl	ICAL	r				EDUI	NDA	NC		SCI	REEN				CII ITI	_	
	1	HDV	/FUI	NC			A				В			С					
NASA IOA	[3	/1R /1R]		[P P]]	P P]	[[P P]		[]	*
COMPARE	[/]		[]		[]	[]		[]	
RECOMMEN	DA'I	ric	ons:		(If	d :	ifi	fere	ent	f	ro	om N	NASA)	•					
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ASSESSME ASSESSME NASA FME	NT	ID):	MPS	-63	3 X							٠	NASA DA BASEL	INE			
SUBSYSTE MDAC ID: ITEM:				EPD 633 LVL				SIM	DI	RY	CMI	о нг	oc					
LEAD ANA	LYS	T:	:	в.	SLA	UG	HTE	R										
ASSESSME	NT:	:																
		FI	CAL LIGH V/FU				REI A	OUNE	AN(CY B	SC	REEI	NS	c		CIL		
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SUBSYSTI MDAC ID: ITEM:			634	&C/MI SENS		SIM D	RY	CMI) HDC					
LEAD AND	ALYS	ST:	в. :	SLAUG	HTE	R								
ASSESSMI	ENT	:												
		FLIG			REDI	JNDAN	CY	SCR	EENS			IL TEI		
	F	IDW/F	JNC		A		В		C	•			•	
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ASSESSME ASSESSME NASA FME	NT	II):		-635 2	2				NASA DA BASELI	INE	[x	-
SUBSYSTE MDAC ID:				635		es Sor si	M WE	T CMD	HDC	:			
LEAD ANA	LYS	5T:	:	в.	SLAUC	HTER							
ASSESSME	NT	:											
		Fl	LIGH			REDUN			EENS	c C		CIL	
	1	HDV	/FU			A		В		-			
NASA IOA	[3 3	/3 /3]	[[NA] NA]]	NA] NA]	[NA] NA]		[] *
COMPARE	[/]	ſ]	[]	[]		(]
RECOMMEN	IDA'	TI	ons:	1	(If d	iffer	ent f	rom N	IASA))			
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ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	MPS-636X	MPS-636X BASELINE []									
SUBSYSTEM: MDAC ID: ITEM:	EPD&C/MPS 636 LVL SENSO		WET	CMD I	HDC						
LEAD ANALYST:	B. SLAUGH	ITER									
ASSESSMENT:											
CRITICALITY REDUNDANCY SCREENS CIL FLIGHT ITEM											
HDW/FU	NC A	L	В		С						
NASA [2 /1R IOA [2 /1R] [P)]	[F]	[P]	[х ј х ј	*		
COMPARE [/] []	[]	[]	[]			
RECOMMENDATIONS:	(If dif	ferent	fro	om NAS	SA)						
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* CIL RETENTION :	RATIONALE:	(If a	ppli	icable		DEQUATE DEQUATE	[]			
ONLY AVAIL REF: 1	MPS/EPDC F	MEA RE	EVIEW	SUMM	IARY	8-17-87	•				

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	MPS-6403	PS-640X BASELINE []						
	EPD&C/MI 640 BUS 2 Al		TREAM HDC					
LEAD ANALYST:	B. SLAUC	HTER						
ASSESSMENT:								
		REDUNDA	NCY SCREE	NS	CIL ITEM			
FLIGH HDW/FU	NC	A	В	С				
NASA [1 /1 IOA [2 /1R]. [NA] P]	[NA] [P]	[NA] [P]	[X] *			
COMPARE [N /N] [N]	[N]	[N]	[]			
RECOMMENDATIONS:	(If d	ifferent	from NAS	SA)				
[2 /1R] [P]	[P]	[P] (A	[] DD/DELETE)			
* CIL RETENTION	RATIONAL	E: (If a	applicable	e) ADEQUATE INADEQUATE	[]			
REMARKS: ONLY AVAILA REF: UNDERLOAD WOULD ARE AVAILABLE AT POWERED BY A SEF	NOT OCCU 1 100.15%	R BECAUS , 100%,	SE OF THE	MARY 8-17-8 FIRST FAILU	7. AN RE. SENSORS			

ASSESSMENT I ASSESSMENT I NASA FMEA #:	D: M	PS-641X					NASA DA' BASELII N		x]
SUBSYSTEM: MDAC ID: ITEM:	6	PD&C/MP 41 US 2 AN		JPSTR	ЕАМ Н	DC			
LEAD ANALYST	: B	. SLAUG	HTER						
ASSESSMENT:									
F	'ICALIT 'LIGHT W/FUNC		REDUN A		Y SCR B		c	CI IT	_
NASA [3 IOA [3	/3] /3]	[]	NA] NA]	[]	NA] NA]	[1	NA] NA]]] *]
COMPARE [/]	[]	[]	[]	[]
RECOMMENDATI	ons:	(If di	ffere	nt f	rom N	ASA)			
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* CIL RETENT	ION RAT	FIONALE:	: (If	app:	licab	7	ADEQUATE ADEQUATE]

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	MPS-642X	PS-642X BASELINE []							
SUBSYSTEM: MDAC ID: ITEM:	EPD&C/MPS 642 BUS 2 AND		TREAM AND	BUS 1 HDC	:				
LEAD ANALYST:	B. SLAUGH	HTER							
ASSESSMENT:									
FLIGH'					CIL ITEM				
	NC 1		В	С					
NASA [1 /1 IOA [2 /1R] [1	NA] [P] [NA] [F] [NA] P]	[X] *				
COMPARE [N /N] [1	и][и] [N]	[]				
RECOMMENDATIONS:	(If di	fferent f	rom NASA))					
[2 /1R] []	P] [F] [P] (Al	[] DD/DELETE)				
* CIL RETENTION	RATIONALE	: (If app		ADEQUATE NADEQUATE	[]				
REMARKS: ONLY AVAIL REF: UNDERLOAD WOULD ARE AVAILABLE AT A SEPARATE BUS.	NOT OCCUR	BECAUSE	EW SUMMA	RY 8-17-87 IRST FAILU	. AN RE. SENSORS				

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	2/17/88 NASA DATA: MPS-643X BASELINE [] 2028-2 NEW [X]						
SUBSYSTEM: MDAC ID: ITEM:	EPD&C/MPS 643 BUS 2 AND 3 DO	WNSTREAM AND BU	IS 1 HDC				
LEAD ANALYST:	B. SLAUGHTER						
ASSESSMENT:							
CRITICALI FLIGHT HDW/FUN	נ	ANCY SCREENS B C	CIL ITEM				
NASA [3 /3 IOA [3 /3		_					
COMPARE [/] []	[] []	[]				
RECOMMENDATIONS:	(If differen	t from NASA)					
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* CIL RETENTION R REMARKS:	RATIONALE: (If	ADE	QUATE [] QUATE []				

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	2/17/88 MPS-6443 2232-1	ζ.		NASA DATA: BASELINE NEW		
	EPD&C/MI 644 BUS 4 RI					
LEAD ANALYST:	B. SLAUC	HTER				
ASSESSMENT:						
CRITICALI FLIGHT	CIL					
HDW/FU		A	В	С		
NASA [2 /1R IOA [3 /1R] [P] [P] [F] [P] [P] P]	[X] *]
COMPARE [N /] [] [и] []	[N]
RECOMMENDATIONS:	(If d	ifferent	from NASA	7)		
[3 /1R] [P] [P] [P] (A)	[D DD/DE] :LETE)
* CIL RETENTION	RATIONAL	E: (If ap	plicable)	ADEQUATE NADEQUATE	[]
REMARKS: ONLY AVAIL REF: POWER PATHS PROV FAILURE WILL NOT	IDE REDU	NDANCY FO	TIEW SUMMA	ARY 8-17-87 RST FAILURE	. PA	RALLEL

ASSESSMENT ASSESSMENT NASA FMEA #	ID: MPS-6	545X		NASA DA' BASELII NI	
SUBSYSTEM: MDAC ID: ITEM:	EPD&C 645 BUS 4				
LEAD ANALYS	r: B. SI	AUGHTER			
ASSESSMENT:					
1	FICALITY FLIGHT DW/FUNC	REDUNI A	DANCY SCRI	eens C	CIL ITEM
NASA [:	3 /3] 3 /3]	[NA] [NA]	[NA] [NA]	[NA] [NA]	[] *
COMPARE [/]	[]	[]	[]	[]
RECOMMENDAT	CONS: (If	differer	nt from NA	ASA)	
[/]	[]	[]	[]	[] ADD/DELETE
* CIL RETENT	TION RATION	ALE: (If	applicabl	.e) ADEQUATE INADEQUATE	

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	MPS-646X				TA: NE [] EW [X]
	EPD&C/MF 646 RPC OUTF		ODE		
LEAD ANALYST:	B. SLAUG	HTER			
ASSESSMENT:					
	ITY	REDUN	DANCY SC	REENS	CIL ITEM
FLIGH HDW/FU		A	В	С	
NASA [2 /1R IOA [3 /1R] [P] P]	[F] [F]	[P] [P]	[X] * [X]
COMPARE [N /] []	[]	[]	[]
RECOMMENDATIONS:	(If d	iffere	nt from	NASA)	
[3 /1R	[]	P]	[F]	[P]	[] (ADD/DELETE)
* CIL RETENTION	RATIONAL	E: (If	applica	ble) ADEQUA' INADEQUA'	re [] re []
REMARKS: ONLY AVAIL REF: POWER PATHS PROV FAILURE WILL NOT	IDE REDU	NDANCY	FOR THE	SUMMARY 8-17 E FIRST FAIL	-87. PARALLEI

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SUBSYSTI MDAC ID: ITEM:				EPD&C 647 RPC C	•		T D	IODI	2								
LEAD ANA	ALYS	ST:		B. SI	ΔU	GH'	TER										
ASSESSMI	ent:	:															
		FL	IGHT	_		R	EDUI	NDAN	CY	SCF	REENS	ļ			IL TEN		
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ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	MPS-648X	:			SA DATA: ASELINE NEW	[x]	
MDAC ID:	EPD&C/MP 648 RPC OUTP		Έ				
LEAD ANALYST:	B. SLAUG	HTER					
ASSESSMENT:							
CRITICALI FLIGHT		REDUNDA	NCY SO	CREENS		CIL ITEM	
HDW/FU		A	В	С			
NASA [2 /1R IOA [3 /1R] [P] P]	[P] [P]	[P [P]	X]] *
COMPARE [N /] []	[]	(1	[N	1
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* CIL RETENTION	RATIONALE	E: (If a	applica	AI	DEQUATE DEQUATE	[]
REMARKS: ONLY AVAIL REF: POWER PATHS PROV FAILURE WILL NOT	IDE REDUI	NDANCY I	FOR TH	E FIRST	FAILURE.	. PA . A	RALLEL SECOND

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SUBSYSTE MDAC ID:			649	&C/MP ITORI		ESIS'	ror						
LEAD ANA	LYS	r:	В.	SLAUG	HTER								
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		FICAL FLIGH			REDUI	NDAN	CY SCR	EENS	5		CI		
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		Fl	[CA] LIGI	HT	Y.		R:		NDA		Y B	SCR	REEN	rs C	ı				CL CEM	ſ	
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SUBSYSTEMDAC ID:	M:			EPI 650 RPG	6	PS										
LEAD ANA	LYS	T:		в.	SLAU	GH	TER									
ASSESSME	NT:															
	CR1			ITY		R	EDUN	DAN	CY	SCF	REENS	5		CII		
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ASSESSME ASSESSME NASA FME	ENT	II		MP	16/3 S-6: 57-	57										DA ELI N		[x]	
SUBSYSTE MDAC ID:				EPI 65' HD		/ M	PS														
LEAD ANA	LYS	ST:	:	в.	SL	AU	GH'	rer	ł												
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	CR]		CAL LIGH				R	EDU	NDA	NC	CY	SCF	REEN	s					IL CEM	1	
	ŀ	HDW	/FUI	NC			A				В			С							
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COMPARE	[/]		ſ]		[3	[]			[]	
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* CIL RE	TEN	ΙTΙ	ON F	LTAS	ONA	LE	€:	(I:	f a	pp	li	.cab	·			UATI UATI		[]	
ONLY AVA	IL	RE	F: M	IPS/	EPD	C	FM	ΙEΑ	RE	VI	EW	SU	MMAI	RY	8-3	17-8	37.				

ASSESSME ASSESSME NASA FME	ENT	ID	:	2/: MP: 22!	S-65	83	•					BASEL		[
SUBSYSTE MDAC ID:				EPI 658 HD	8	/MI	PS									
LEAD ANA	LY	ST:		в.	SL	AUC	HTER									
ASSESSMI	ENT	:														
	CR			ITY			REDUNI	DAN	CY	SCR	EENS	3		CIL		
	1		IGH /FU				A		В	;		С		111	**	
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COMPARE	[/]		[]	[]	[]		[)	
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	[/	3		[]	[1	[]	(A)	[DD/E		TE)
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SUBSYSTE MDAC ID: ITEM:	M:		EPD&C 659 MONIT			SIST	OR				
LEAD ANA	LYS'	T:	B. SL	AUGI	ITER						
ASSESSME	NT:										
		TICAL FLIGH DW/FU	r	I Z			Y SCR B	EENS	S C	CII	
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COMPARE	[/]	ĺ]	[]	[]	[]
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SUBSYSTEM MDAC ID:				66	D&C/ O C OU			DI	ODI	Ξ											
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(CRI		CAL				RE	EDUN	DAI	1CY	S	CREE	NS	;				CI IT	_	1	
	F		/FUI				A			В	3			С							
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REMARKS: ONLY AVA	IL	RI	EF:	MF	S/E	PD	C I	FMEA	R	EV]	EW	SUM	IMZ	AR:	8 3	-17-	8	7.			

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	MPS-661X		1	NASA DATA BASELINE NEW	•]
SUBSYSTEM: MDAC ID: ITEM:	EPD&C/MPS 661 RPC OUTPUT	r DIODE				
LEAD ANALYST:	B. SLAUGH	TER				
ASSESSMENT:						
CRITICAL: FLIGHT	r	EDUNDANCY	SCREENS		CIL	
HDW/FUI	NC A	В	(2		
NASA [3 /1R IOA [3 /1R] [P] [F] [F] []	?]	[X] *
COMPARE [/] [] [] []	[]
RECOMMENDATIONS:	(If diff	ferent fro	om NASA)			
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* CIL RETENTION I	RATIONALE:	(If appli	Ţ	DEQUATE]
ONLY AVAIL REF: N	MPS/EPDC FM	MEA REVIEW	SUMMARY	8-17-87	•	

ASSESSME ASSESSME NASA FME	NT	II		MP	S-66	BASELINE BASELINE												
SUBSYSTE MDAC ID: ITEM:				66	D&C/ 2 C OU			r DI	ODE									
LEAD ANA	LYS	ST:	:	в.	SL	U	GH?	rer										
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REMARKS ONLY AV	: AIL	R	EF:	MPS	S/EP	DC	F	MEA	REV	ΊE	w st	J MMA I	RY	8-17	-87	•		

ASSESSMI ASSESSMI NASA FMI	ENT	ID:	2/16 MPS- 2380	-663	X		NASA DATA: BASELINE [] NEW [X]						
SUBSYSTI MDAC ID: ITEM:			EPD8 663 BLEE	•	PS ESISTO	ORS							
LEAD AND	LYS	ST:	в. s	LAU	GHTER								
ASSESSMI	ENT:	:											
		TICAL FLIGH IDW/FU	T		REDUN	IDANC	EY SCR B		с	CII	_		
NASA IOA]	3 /3 3 /3]	[NA]]	NA] NA]		NA] NA]]] *		
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REMARKS:

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	MPS-667X	NASA DATA BASELINI NEV							
	EPD&C/MPS 667 BACKUP LH2 VLV	V SWITCH FUSE							
LEAD ANALYST:	B. SLAUGHTER	. SLAUGHTER							
ASSESSMENT:									
CRITICAL FLIGH	DANCY SCREENS	CIL ITEM							
HDW/FU		В С							
NASA [2 /1R IOA [3 /1R] [F]] [P]	[F] [P] [P] [P]	[X] * []						
COMPARE [N /] [N]	[N] []	[N]						
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* CIL RETENTION	RATIONALE: (If	applicable) ADEQUATE INADEQUATE							
REMARKS: ONLY AVAIL REF: COMPUTER DUMP CO									

ASSESSMI	ASSESSMENT DATE: 2/16/88 ASSESSMENT ID: MPS-668X NASA FMEA #: 2162-2					NASA DATA: BASELINE [] NEW [X]						
SUBSYSTI MDAC ID: ITEM:			668	&C/MPS		E SW:	ITCH S	5 1				
LEAD AND	ALY	ST:	в.	SLAUGH	ITER							
ASSESSMI	ENT	:										
		ITICAL FLIGH HDW/FU	T	_		NDANG	CY SCE	REENS	S C		CII	
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REMARKS:

	2/16/88 MPS-6693 2162-3	ζ.		NASA DATA BASELINE NEW	
	EPD&C/MI 669 DUMP SEC		SWITCH S1		
LEAD ANALYST:	B. SLAU	GHTER			
ASSESSMENT:					
CRITICAL		REDUND	ANCY SCRE	ens	CIL ITEM
FLIGH HDW/FU		A	В	С	11211
NASA [2 /1R IOA [2 /1R] [F] P]	[F] [P]	[P] [P]	[X] * [X]
COMPARE [/] [N]	[N]	[]	[]
RECOMMENDATIONS:	(If d	ifferen	t from NA	SA)	
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* CIL RETENTION	RATIONAL	E: (If	applicabl	e) ADEQUATE INADEQUATE	[]
REMARKS: ONLY AVAIL REF: INSTRUMENTATION	MPS/EPDC	: FMEA R	REVIEW SUM E FAILURE	MARY 8-17-8	7.

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:			NASA DATA BASELINE NEW	
	EPD&C/MPS 670 BACKUP LH2 VAI	LVE SWITCH	S2	
LEAD ANALYST:	B. SLAUGHTER			
ASSESSMENT:				
CRITICAL: FLIGHT		DANCY SCRE	ENS	CIL ITEM
HDW/FU		В	С	TIEM
NASA [2 /1R IOA [3 /1R] [F]] [P]	[F] [P]	[P] [P]	[X] * []
COMPARE [N /] [N]	[N]	[]	[N]
RECOMMENDATIONS:	(If differen	t from NA	SA)	
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REMARKS:			ADEQUATE INADEQUATE	•
ONLY AVAIL REF: M COMPUTER DUMP COM	PS/EPDC FMEA R MAND REDUNDANT	EVIEW SUMM TO THE SV	MARY 8-17-87. NITCH DUMP CO	. IOA CALLS OMMAND.

ASSESSMEI ASSESSMEI NASA FME	NT ID:	2/16/88 MPS-671 2163-2			NASA DATA BASELINE NEW]
SUBSYSTEM MDAC ID:	M:	EPD&C/M 671 BACKUP		/E SWITCH	S2		
LEAD ANA	LYST:	B. SLAU	JGHTER				
ASSESSME	NT:						
	CRITICAL FLIGH	T		ANCY SCRE	ENS C	CIL ITEM	ſ
	HDW/FU		A	В	C		
NASA IOA	[3 /3 [3 /3] [[NA] [NA]	[NA] [NA]	[NA] [NA]	[] *]
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RECOMMEN	DATIONS:	(If o	differen	t from NA	SA)		
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REMARKS:							

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	MPS-672X	PS-672X BASELINE []								
	672									
LEAD ANALYST:	B. SLAUGHTER									
ASSESSMENT:										
CRITICAL: FLIGHT	CIL ITEM									
HDW/FU	NC A	В С								
NASA [3 /3 IOA [1 /1] [NA] [] [NA] [NA] [NA] NA] [NA]	[] * [x]							
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REMARKS: ONLY AVAIL REF: MPS/EPDC FMEA REVIEW SUMMARY 8-17-87. PROPELLANT VENTING DURING BOOST COULD CAUSE FIRE/EXPLOSION. SOFTWARE INHIBITS WERE NOT CONSIDERED.										

ASSESSMEI ASSESSMEI NASA FME	NT ID:		73X			NASA DAT BASELIN NE	'A: IE [] IW [X]
SUBSYSTEM MDAC ID:		EPD&C 673 BACKU	•	2 VA	LVE SWITCH	: S2	
LEAD ANA	LYST:	B. SL	AUGH'	TER			
ASSESSME	NT:						
	CRITICA FLIG		R	EDUN	DANCY SCRE	ENS	CIL ITEM
	HDW/F	JNC	A		В	С	
NASA IOA	[2 /1] [2 /1]	R] R]	[F]	[F] [P]	[P] [P]	[X] * [X]
COMPARE	[/]	[N	1	[N]	[]	[]
RECOMMEN	DATIONS	: (If	dif	fere	nt from NA	ASA)	
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* CIL RE	TENTION	RATION	ALE:	(If	applicabl	Le) ADEQUATI INADEQUATI	E [] E []
REMARKS: ONLY AVA FAILURE	IL REF:	MPS/EI	DC F	MEA	REVIEW SU	MARY 8-17-8	

ASSESSME	SSESSMENT DATE: 2/16/88 SSESSMENT ID: MPS-675X ASA FMEA #: 2023-1						NASA DATA: BASELINE [] NEW [X]						
SUBSYSTE MDAC ID:			EPD& 675 LIMI	•	s Sisto	ORS							
LEAD ANA	LYS	r:	B. S	LAUG	HTER								
ASSESSME	NT:												
]	FICAL FLIGH DW/FU	r		REDUN A	NDANC	CY SCR		c	CII			
NASA IOA	[:	3 /3]	[]	NA] NA]	[NA] NA]	[NA] NA]	[] *		
COMPARE	[/]	[]	[]	[]	[]		
RECOMMEN	DAT]	cons:	(I	f di:	ffere	ent f	rom N	'ASA)					
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SUBSYSTEMDAC ID:	M:		676	C/MP	S SISTO	RS							
LEAD ANA	LYST	:	B. S	LAUG	HTER								
ASSESSME	NT:												
	CRIT				REDUN	DANC	Y SCR	EENS			CIL		
		LIGH W/FU			A		В	C	2				
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REMARKS:

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	MPS-680X		NASA DATA BASELINE NEW	• •
SUBSYSTEM: MDAC ID: ITEM:	EPD&C/MPS 680 STATUS LIGHT			
LEAD ANALYST:	B. SLAUGHTER			
ASSESSMENT:				
CRITICAL: FLIGHT	r	DANCY SCREE	INS	CIL ITEM
HDW/FU	NC A	В	С	
NASA [3 /1R IOA [3 /3] [P]] [NA]	[F] [NA]	[P] [NA]	[X] *
COMPARE [/N] [N]	[N]	[N]	[N]
RECOMMENDATIONS:	(If differer	nt from NAS	(A)	
[3 /3] [NA]	[NA]		[D] DD/DELETE)
* CIL RETENTION F	RATIONALE: (If		ADEQUATE	
REMARKS: ONLY AVAIL REF: M VIOLATES NTS 2220	MPS/EPDC FMEA F 06 3.3.3F.		~	

ASSESSMEN ASSESSMEN NASA FMEN	T	ID):	2/17/88 NASA DATA MPS-681X BASELINE 2407-1 NEW						E									
SUBSYSTEM MDAC ID:				EPD&C 681 METER			(PC)												
LEAD ANA	LYS	T:	:	B. SL	AU	3H?	rer												
ASSESSME	NT:	:																	
	CRI		CAL.			R	EDUNI	OANC	C.	Y	SCRE	EEN	S				L LEN		
	F		LIGH' V/FUI	NC NC		A]	В			(С				•	
NASA IOA]	3	/1R /3]	[P N] A]	[1	F NA]	[]]	P] NA]		[X]	*
COMPARE	[/N	1	ĺ	N]	[1	N]	[N]		[N]	
RECOMMEN	DA!	ric	ons:	(If	đ	if	fere	nt :	f	ro	m N	ASA	.)						
	[3	/3]	[N	A]	[NA	.]	[EL:	ETE)
* CIL RE	TE	NT	ION	RATION	IAL	E:	(If	ap	p	li	.cab			ADEQUATI ADEQUATI	2 2	[]	
REMARKS:	IL	R TC	EF:	MPS/EI	PDC	F.	MEA	REV	Ί	EV	SU.	MM2	\R	XY 8-17-8	37	•	N	AS.	A

ASSESSMENT DATE ASSESSMENT ID: NASA FMEA #:	MPS-682			NASA DATA BASELIN NEV	
SUBSYSTEM: MDAC ID: ITEM:	EPD&C/M 682 METER M		LH2 MANF.	PRESSURE)	
LEAD ANALYST:	B. SLAU	GHTER			
ASSESSMENT:					
CRITICA FLIG		REDUND	ANCY SCRE	ENS	CIL ITEM
HDW/F	UNC	A	В	С	TILM
NASA [2 /1 IOA [3 /3	R] [P] NA]	[F] [NA]	[P] [NA]	[X] *
COMPARE [N /N] [n j	[N]	[N]	[N]
RECOMMENDATIONS	(If d	ifferen	t from NA	SA)	
[3 /3] [NA]	[NA]		[D] .DD/DELETE
* CIL RETENTION	RATIONAL	E: (If a	applicable	e)	
REMARKS:				ADEQUATE INADEQUATE	[]
ONLY AVAIL REF: VIOLATES NTS 22	MPS/EPDC 206 3.3.3	FMEA RI	EVIEW SUM	MARY 8-17-87	. NASA

ASSESSMENT ID:	ESSMENT DATE: 2/17/88 NASA DATA: ESSMENT ID: MPS-683X BASELINE [] A FMEA #: 2409-1 NEW [X]							
-	EPD&C/MI 683 METER MA	PS 4 (HELIUM	PRESSURE))				
LEAD ANALYST:	B. SLAUC	GHTER						
ASSESSMENT:								
CRITICAL		REDUNDANC	CY SCREENS	5	CIL ITEM			
FLIGH HDW/FU	_	A	В	С	11111			
NASA [3 /1R IOA [3 /3] [P] [NA] [F] [NA] [P] NA]	[X] *			
COMPARE [/N] [N] [и] [N]	[N]			
RECOMMENDATIONS:	(If d	ifferent 1	from NASA)				
[3 /3] [NA] [NA] [[D] DD/DELETE)			
* CIL RETENTION	RATIONAL	E: (If ap)		ADEQUATE NADEQUATE	[]			
REMARKS: NASA VIOLATES NT REVIEW SUMMARY 8		2.3.3F.	ONLY AVAI	L REF: MPS	/EPDC FMEA			

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:		NASA DATA: BASELINE [] NEW [X]						
	EPD&C/MPS 684 TOGGLE SW	ITCH (TANK/	REG SELECT	FOR METER M4)				
LEAD ANALYST:	B. SLAUGH	rer						
ASSESSMENT:								
		EDUNDANCY S	CREENS	CIL				
FLIGH HDW/FU		В	С	ITEM				
NASA [3 /1R IOA [3 /3	[P] [F]	[P] [NA]	[X] *				
COMPARE [/N) [N] [N]	[N]	[N]				
RECOMMENDATIONS:	(If dif	ferent from	NASA)					
[3 /3] [N2	A] [NA]	[NA]	[D] (ADD/DELETE)				
* CIL RETENTION	RATIONALE:	(If applica	able)					
REMARKS:			ADEQUA INADEQUA					
NASA VIOLATES NT REVIEW SUMMARY 8	S 22206 2.3 -17-87.	3.3F. ONLY	AVAIL REF:	MPS/EPDC FMEA				

ASSESSME ASSESSME NASA FME	NT	ID		MPS	PS-801X BASELINE [] D18-1 NEW [X]										
SUBSYSTE MDAC ID: ITEM: CONTROLI		(4)	001	PD&C/MPS 01 H2 FEED MANIFOLD RTLS PRESS VALVES 3. SLAUGHTER								REMC	TE	POWER
LEAD ANA	LYS	T:		В.	SLAUC	HTE	R								
ASSESSMI	ent:														
	CRI		CAL			RED	UNDAN	CY	SCRI	EENS	;		CIL ITEN	ſ	.4
	H		JIGH I/FU			A		В			С				
NASA IOA	[3	/3 /3]	[NA]	[NA NA	\]		NA] NA]		[]	*
COMPARE	[/]	ſ]	[3	[1		[]	
RECOMME	NDA'	ric	ons:		(If d	iffe	erent	fro	om N	ASA))				
	[/]	[] []	[]	(AE	[D/D		TE)
* CIL R	ETE	NT:	ION	RAT	IONAL	E:	(If ap	pl:	icab		ADEQUAT NADEQUAT		[]	
REMARKS ABORT C	: RIT	IC.	ALII	I Y:	S 2/1	R F	OR AN	RT	LS.						

ASSESSMI ASSESSMI NASA FMI	ENT	ID:	MPS	/01/88 NASA DATA: PS-802X BASELINE [] D19-3 NEW [X]									
SUBSYSTI MDAC ID: ITEM: DIODE (2	•		802	&C/MP: FEED		FOLD) RTLS	S PRE	SS VALVE	S RP	CAC)UTPUT	
LEAD AND	ALYS'	r:	В. 5	LAUGI	HTER								
ASSESSMI	ENT:												
	1	FICAI	ΙΤ				Y SCR			CII ITI			
	u	OW/FU	INC	A	1		В	(С				
NASA IOA	[3	3 /3]	[N	IA] IA]	[NA] NA]	[]	NA] NA]	[] *]		
COMPARE	[/]	[]	[1	C]	E]		
RECOMMEN	DATI	ons:	(I	f dif	fere	nt f	rom N	ASA)					
	[/]	[]	[]	[]	[ADD/D] ELET:	E)	
* CIL RE	TENT	NOI	RATIO	NALE:	(If	app:	licab	7	ADEQUATE]		
REMARKS: CRITICAL	ITY	IS 2	/1R F	OR AN	RTLS	ABO	ORT		- 2, 2 2	L	J		

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	MPS-803X BASELINE								
	EPD&C/MPS 803 LH2 FEED M RS (4)	ANIFOLD RT	LS PRESS VALVE	ѕ нүг	BRID				
LEAD ANALYST:	B. SLAUGHT	ER							
ASSESSMENT:									
CRITICALI FLIGHT HDW/FUN	?	DUNDANCY S	CREENS C	CII					
NASA [3 /3 IOA [3 /3] [NA] [NA] [NA]	[NA] [NA]]] *				
COMPARE [/] [] []	[]	[]				
RECOMMENDATIONS:	(If diff	erent from	NASA)						
[/] [] []	[] ([ADD/D] ELETE)				
* CIL RETENTION R REMARKS: CRITICALITY IS 2/			able) ADEQUATE INADEQUATE]				

ASSESSME ASSESSME NASA FME	NT I	D:	MPS	1/88 -804X 2-3					ASA DATA BASELINE NEW]	
SUBSYSTE MDAC ID: ITEM: DIODE (2			804	&C/MF		RPC	С	OUTPUT				
LEAD ANA	LYST	:	в.	SLAUG	HTER							
ASSESSME	NT:											
		ICAL LIGH			REDUN	DANCY	SCR	EENS		CIL		
	HD	W/FU	NC		A	В	3	C				
NASA IOA	[3 [3	/3 /3]	[[NA] NA]	[N [N	IA] IA]	[N	A] A]	[]	*
COMPARE	[/]	[]	[]	[]	[]	
RECOMMEN	IDATI	ons:	. ((If di	iffere	ent fr	om N	IASA)				
	[/]	[]	[]	[] (2	[DD/I		
* CIL RE		NOI	RAT	IONALI	E: (If	appl	licab	A	DEQUATE]	
CRITICAL		IS 2	2/1R	FOR 2	AN RTI	LS ABO	DRT					

ASSESSMEN ASSESSMEN NASA FME	I TV	D:	MPS-8	2/01/88 NASA DATA: MPS-805X BASELINE [2383-3 NEW []	
SUBSYSTEM MDAC ID: ITEM: CROSSOVE						FOLE) RTLS	PRI	ess val	VES	RP	C (С	
LEAD ANA	LYST	:	B. SL	AUG	HTER									
ASSESSME	T:													
(F	ICAL LIGH			REDUNI	OANC	EY SCR	EENS	s c		CI IT	L EM		
NASA		/3		[NA]	[NA]	[NA]		[] ,	*
IOA	[3	/3]	[NA]	[NA]	[NA]		[]	
COMPARE	[/	3	[]	[]	[]		[]	
RECOMMEN	DATI	ons:	(If	di	ffere	nt 1	from N	IASA)	ŀ					
	(/	1	[]	[]	[]	(AI	[DD/	DE] LE:	ΓE)
* CIL RET	TENT	'ION	RATION	ALE	E: (If	app	olicab	•	ADEQUA NADEQUA		-]	
THE FAIL	URE	IS C	RITICA	LII	Y 1/1	DUI	RING A	N R	rls.					

ASSESSME ASSESSME NASA FME	NT ID:	2/02/88 MPS-806 2050-1		NASA DATA: BASELINE [] NEW [X]							
SUBSYSTE MDAC ID: ITEM: CONTROLL		EPD&C/M 806 HELIUM		BLOWDOWN	VALVES HYBRI	D DRIVER					
LEAD ANA	LYST:	B. SLAU	GHTER								
ASSESSME	NT:										
	CRITICAL FLIGH HDW/FU	T	REDUNI A	B	ENS C	CIL ITEM					
NASA IOA	[/ / 3 / 3] [] NA]	[] [AN]	[] [NA]	[] *					
COMPARE	[N /N) [и ј	[N]	[N]	[]					
RECOMMEN	DATIONS:	(If d	lifferer	nt from NA	SA)						
	[3 /3] [NA]	[NA]		[.DD/DELETE					
REMARKS:	TENTION :		·	applicabl	e) ADEQUATE INADEQUATE	[]					
CULTICAL	TII LOK .	UN WOOKI	. IO I/I	- •							

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	2/01/88 MPS-807X 2111-2			BASELIN	VE []
	EPD&C/MPS 807 HELIUM IS		ON B VALV	E TOGGLE SV	VITCH
LEAD ANALYST:	B. SLAUG	HTER			
ASSESSMENT:					
CRITICAL FLIGH	r	REDUNDA A	ANCY SCRE B	ENS C	CIL ITEM
HDW/FU			_		
NASA [3 /1R IOA [3 /1R] [P] P]	[P] [P]	[P] [P]	[] *
COMPARE [/] []	[]	[]	[]
RECOMMENDATIONS:	(If di	fferen	t from NA	SA)	
[/] []	[]	[]	[] (ADD/DELETE)
* CIL RETENTION	RATIONALE	: (If	applicabl	.e) ADEQUAT INADEQUAT	•

REMARKS:

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	2/01/88 MPS-8083 2114-2	PS-808X BASELINE []							
SUBSYSTEM: MDAC ID: ITEM:	EPD&C/MI 808 HELIUM		"B" VALV	E SWITCH BI	LOCKING DIODE				
LEAD ANALYST:	MCNICOLI	L							
ASSESSMENT:									
CRITICAL FLIGH HDW/FU	T	REDUNDANC	Y SCREENS	s c	CIL ITEM				
NASA [3 /3	1 [NA) r	NA] [NA]	r 1 *				
IOA [3 /1R		P] [P]	[X]				
COMPARE [/N] [и] [и][N]	[N]				
RECOMMENDATIONS:	(If di	ifferent f	rom NASA)	ľ					
[3 /1R] [P] [F] [P] (AI	[] DD/DELETE)				
* CIL RETENTION	RATIONALE	E: (If app	•	ADEQUATE	[]				
REMARKS:				IADEQUATE	[]				
A LOSS OF ALL RE	DUNDANCY	COULD RES	ULT IN AN	EXPLOSION	DUE TO LACK				

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	2/01/88 MPS-809X 2115-3		BASELINI NEV	
SUBSYSTEM: MDAC ID: ITEM:	EPD&C/MPS 809 HELIUM ISO	LATION "B"	VALVE RPC OUT	PUT DIODE (6)
LEAD ANALYST:	B. SLAUGHT	ER		•
ASSESSMENT:				
CRITICAI FLIGH		DUNDANCY SO	CREENS	CIL ITEM
HDW/FU		В	С	
NASA [3 /1H IOA [3 /1H	R] [P] [F]] [P]	[P] [P]	[X] * []
COMPARE [/] [] [N]	[]	[N]
RECOMMENDATIONS	: (If diff	erent from	NASA)	
[3 /11	R] [P] [P]	[P]	[D] ADD/DELETE)
* CIL RETENTION REMARKS:	RATIONALE:	(If applica	able) ADEQUATE INADEQUATE	
THE FAILURE IS	DETECTABLE.			

ASSESSMENT ID:	2/02/88 MPS-810X 2117-2		DATA: CLINE [] NEW [X]
SUBSYSTEM: MDAC ID: ITEM:	EPD&C/MPS 810 HELIUM ISOLAT	ION "A" VALVE TOGG	LE SWITCH
LEAD ANALYST:	B. SLAUGHTER		•
ASSESSMENT:			
CRITICALI FLIGHT HDW/FUN	r	DANCY SCREENS B C	CIL ITEM
NASA [3 /1R IOA [3 /1R] [P]	[P] [P]	[] *
COMPARE [/] []	[] []	[]
RECOMMENDATIONS:	(If differer	nt from NASA)	
[/] []	[] []	[] (ADD/DELETE)
* CIL RETENTION F	RATIONALE: (If	applicable) ADEQU INADEQU	

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	2/02/88 MPS-811 2119-2	x	NASA DATA: BASELINE [] NEW [X]						
SUBSYSTEM: MDAC ID: ITEM:	EPD&C/M 811 HELIUM		"A" VALVE	SWITCH BI	LOCKING DIODE				
LEAD ANALYST:	B. SLAU	GHTER							
ASSESSMENT:									
CRITICAI FLIGH		REDUNDANO	Y SCREENS	5	CIL ITEM				
HDW/FU		A	В	С					
NASA [3 /3 IOA [3 /1F] [NA] [P] [NA] [F] [NA] P]	[x] *				
COMPARE [/N] [и][и][N]	[N]				
RECOMMENDATIONS	(If d	ifferent	from NASA)					
[3 /11	R] [P] [F] [P] (A	[A] DD/DELETE)				
* CIL RETENTION	RATIONAL	E: (If ap)		ADEQUATE NADEQUATE	[]				
REMARKS: LOSS OF ALL RED OF HELIUM PURGE			LT IN AN	EXPLOSION	DUE TO LACK				

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	MPS-812X	NASA DA BASELI N	
SUBSYSTEM: MDAC ID: ITEM:	EPD&C/MPS 812 HELIUM ISOLAT	ION "A" VALVE SWITCH	BLOCKING DIODE
LEAD ANALYST:	B. SLAUGHTER		
ASSESSMENT:			
CRITICAL: FLIGHT		DANCY SCREENS	CIL ITEM
HDW/FU	NC A	ВС	
NASA [3 /3 IOA [3 /1R] [NA]] [P]	[NA] [NA] [F]	[] * [X]
COMPARE [/N] [N]	[N] [N]	[N]
RECOMMENDATIONS:	(If differer	nt from NASA)	
[3 /1R] [P]	[F] [P]	[A] (ADD/DELETE)
* CIL RETENTION F	RATIONALE: (If	applicable) ADEQUAT INADEQUAT	
REMARKS: LOSS OF ALL REDUN HELIUM PURGE IN A	NDNCY COULD RES	BULT IN AN EXPLOSION	DUE TO LACK OF

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	2/02/88 MPS-813 2120-1		NASA DATA: BASELINE [] NEW [X]						
SUBSYSTEM: MDAC ID: ITEM: DIODES	EPD&C/M 813 HELIUM		N VALVE T	'RANSIENT SU	PPRESSION				
LEAD ANALYST:	B. SLÀU	GHTER							
ASSESSMENT:									
CRITICAL FLIGH	T	REDUNDA A	NCY SCREE	ens C	CIL ITEM				
HDW/FU			_						
NASA [3 /3 IOA [3 /1F] [NA] P]	[NA] [F]	[NA] [P]	[] * [X]				
COMPARE [/N] [N]	[и]	[N]	[и]				
RECOMMENDATIONS:	(If d	ifferent	from NAS	SA)					
[3 /1	?] [P]	[F]	[P]	[A] ADD/DELETE)				
* CIL RETENTION	RATIONAL	E: (If a	ipplicable	ADEQUATE					
REMARKS: LOSS OF ALL REDU OF HELIUM PURGE			BULT IN AN	INADEQUATE N EXPLOSION					

SA DATA: ASELINE [] NEW [X]
CIL
1124
] [] *] [x]
] [N]
[A] (ADD/DELETE)
EQUATE [] EQUATE []
ITEM

PARALLEL PATH MASKS THE FAILURE.

ASSESSMEN ASSESSMEN NASA FME	NT	ID	:	MPS	-815									ASA DA BASELI N	NE			
SUBSYSTEM MDAC ID:				815	&C/M													
LEAD ANALYST: B. SLAUGHTER																		
ASSESSME	NT:																	
	CRI					F	EDU	JND	ANC	CY	SCRE	ENS	5			CIL		
	F		IGHT /FUI	_		7				В			С			112	•	
NASA IOA	[3	/1R /3]	!	I	P] [A]]	P NA]	[P NA] A]		[]	*
COMPARE	[/N]	1	1	ıj		[N]	[N]		[]	
RECOMMEN	'DA'I	OI	NS:	(If	lii	fer	ren	t :	fro	om NA	SA))					
	(3	/3]	1	[]	IA]		[N.	A]	[N	A]	(Al	[DD/D		ETE)
* CIL RE	TE	ITI	ON I	RAT]	ONA	LE:	(]	Ιf	apj	pli	cabl	e)				_		
												I	A AN	DEQUA' DEQUA	TE TE	[]	
REMARKS: ONLY AVAILABLE REF: EPDC/MPS FMEA REVIEW SUMMARY 8-17-87 AFT PURGE AFTER A NOMINAL MISSION IS NON-CRITICAL. CRITICALITY FOR AN ABORT IS 2/1R.																		

ASSESSMEN ASSESSMEN NASA FMEA	I TV		2/02/ MPS-8 2301-	316								N		DATA ELINE NEW]	x]	
SUBSYSTEM MDAC ID: ITEM:	1 :		EPD&0 816 HDC	•		2)												
LEAD ANAI	LYST	:	B. SI	LAU	GH'	rer												
ASSESSMEN	T:																	
C	F	ICAL: LIGH: W/FUI	r		RI A	EDU	NDA	NC	eY B	sc	REEN	s c				IL PEM	Í	
NASA IOA	[3	/3 /1R]	[NZ P	A]		[NA P]]	N P	A]		[]	*
COMPARE	[/N]	[N]		(N]	[N]		[]	
RECOMMEND	ATI	ons:	(If	đ.	if	fere	ent	f	ro	m	NASA)						
	[3	/1R]	[P]	į	[P]	[P]	(A	[DD/	'DE]	TE
* CIL RET	ENT	ION I	RATION	IAL	E:	(If	f ap	qq	li	ca	•			JATE JATE	[]	
OPENING O	F A	LL RE	EDUNDA	NT	V2	LVE	es v	VO	UL	D	VENT	H	ELII	JM SU	ppr	.v.		

ASSESSME ASSESSME NASA FME	NT I	D:	MPS-	-817X	NASA DATA: BASELINE (NEW (X								
SUBSYSTE MDAC ID:			817	C/MPS	s Witch								
LEAD ANA	LYST	:	в. s	LAUG	HTER								
ASSESSME	ENT:												
		ICAL LIGH	ITY T	1	REDUN	DANC	Y SCR				CIL		
	HD	W/FU	NC	2	A	:	В	(С				
NASA IOA	[3 [3	/3 /3]	[]	NA] NA]	[]	NA] NA]	[]	NA] NA]		[] *]	
COMPARE	[/]	[]	[]	[]		[]	
RECOMMEN	ITADI	ons:	(:	If di	ffere	nt f	rom N	ASA)					
	[/]	[]	[]	[]	(A	[DD/[] ELETE	:)
* CIL RI		NOI	RATI(ONALE	: (If	app	licab		ADEQU ADEQU		[]	
CRITICA		FOR	AN A	BORT	IS 2/	1R.							

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	MPS-818X				ASA DATA BASELINE NEW	[]
	EPD&C/MPS 818 TOGGLE SW						
LEAD ANALYST:	B. SLAUGH	TER					
ASSESSMENT:							
CRITICALI FLIGHT	ITY R	EDUNDANC	Y SCRE	ENS		CIL	AF.
HDW/FU			В	С		1111	M .
NASA [3 /1R IOA [3 /1R] [P] [P] P]	[P]	[] *
COMPARE [/] [] []	[]	ί]
RECOMMENDATIONS:	(If dif	ferent f	rom NAS	SA)			
[/] [) []	[[DD/DE] ELETE)
* CIL RETENTION F	RATIONALE:	(If app	licable	AD	EQUATE EQUATE	[]
REMARKS: A LOSS OF ALL REI SUPPLY.	OUNDANCY CO	OULD REST	JLT IN		~	•	UM

	2/02/88 MPS-819 2302-3				
SUBSYSTEM: MDAC ID: ITEM:	EPD&C/M 819 TOGGLE				
LEAD ANALYST:	Ŗ. SLAU	GHTER			
ASSESSMENT:					
CRITICA FLIC		REDUNDA	NCY SCREE	ns	CIL ITEM
	UNC	A	В	С	11111
NASA [3 /: IOA [3 /:	.R] [P] NA]	[F] [NA]	[P] [NA]	[X] * []
COMPARE [/	[]	N]	[и]	[и]	[N]
RECOMMENDATION	: (If d	lifferent	from NAS	A)	
[3 /	;] [NA]	[NA]	[NA] (A	[D] DD/DELETE)
* CIL RETENTION	RATIONAL	E: (If a	pplicable	ADEQUATE	[]
REMARKS:				INADEQUATE	
AFT PURGE AFTE		AL MISSIO	n is non-	CRITICAL.	CRITICALITY

	2/03/88 MPS-820 2131-3	x		NASA DATA BASELINE NEW	
	EPD&C/M 820 HELIUM		R VALVE T	roggle switc	н
LEAD ANALYST:	B. SLAU	GHTER			
ASSESSMENT:					
CRITICAL FLIGH HDW/FU	r	REDUNDA A	NCY SCREE	ens C	CIL ITEM
•			_		
IOA [3 /1R] [P]	[P] [NA]	[P]	[] *
COMPARE [/] []	[и]	[]	[]
RECOMMENDATIONS:	(If d	ifferent	from NAS	SA)	
[3 /1R] [P]	[NA]		[] DD/DELETE)
* CIL RETENTION I	RATIONAL	E: (If a	pplicable	e) ADEQUATE INADEQUATE	[]
THE NASA SCENARIO	CALLS !	THE LOSS	OF A SEC	OND UNRELAT	ED ENGINE

REDUNDANCY. THE SWITCH IS STANDBY REDUNDANT. NSTS 22206 2.3.3L REQUIRES ASSIGNMENT OF 3/1R FOR FAILURES RESULTING IN AN ENGINE

SHUTDOWN.

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	MPS-821X	BASELINE NEV	
MDAC ID:	EPD&C/MPS 821 HELIUM CROSSOVE	R VALVE TOGGLE SWITC	ЭН
LEAD ANALYST:	B. SLAUGHTER		
ASSESSMENT:			
CRITICAL: FLIGH	ITY REDUNDA T	NCY SCREENS	CIL ITEM
HDW/FU	NC A	в с	
NASA [3 /1R IOA [3 /1R] [P]] [P]	[P] [P] [NA] [P]	[] *
COMPARE [/	1 []	[א]	[]
RECOMMENDATIONS:	(If different	from NASA)	
[3 /1R] [P]	[NA] [P]	[] ADD/DELETE)
* CIL RETENTION	RATIONALE: (If a	pplicable) ADEQUATE INADEQUATE	[]
REMARKS: ONLY AVAIL REF: STANDBY REDUNDAN FOR FAILURES RES	T. NSTS 22206 2	EVIEW SUMMARY. THE .3.3L REQUIRES ASSIG	SWITCH IS

ASSESSMENT DATE ASSESSMENT ID: NASA FMEA #:	MPS-822			NASA DATA BASELINE NEW	
	822		ER VALVE	CIRCUIT HDC	
LEAD ANALYST:	B. SLAU	GHTER			
ASSESSMENT:					
CRITICA FLIG	LITY HT	REDUND	ANCY SCRE	EENS	CIL ITEM
		A	В	С	IIEM
NASA [3 /1 IOA [3 /1	R] [R] [P] P]	[P] [P]	[P] [P]	[] *
COMPARE [/] []	[]	[]	[]
RECOMMENDATIONS	: (If d	ifferen	t from NA	asa)	
[/] []	[]		[] .DD/DELETE
* CIL RETENTION	RATIONAL	E: (If	applicabl	ADEQUATE	[]
REMARKS:				INADEQUATE	[]
THE NASA SCENAR REDUNDANCY. NS	rs 22206	2.3.3L	REQUIRES	ASSIGNMENT O	F 3/1R FO
FAILURES RESULT	ING IN AN	ENGINE	SHUTDOWN	. NSTS 2220	6 2.3.3L

ENGINE SHUTDOWN.

REQUIRES ASSIGNMENT OF 3/1R FOR FAILURES RESULTING IN AN

ASSESSMI ASSESSMI NASA FMI	ENT	I		•	3/88 -8231 3-2	K				NASA BASI	ELINE]	
SUBSYSTIMDAC ID ITEM: (2)				823	&C/MI	PS CROSSO	VER	VALVE	CIR	CUIT	BLOC	KING	; DI	ODES
LEAD AN	ALY	ST	:	В.	SLAUC	SHTER								
ASSESSMI	ENT	:												
	CR		ICA LIGI	LITY HT		REDUN	IDANC	CY SCR	EENS	;		CII		
	1	HDI	W/FU	JNC		A		В		С				
NASA IOA	[3	/3 /3]] [NA] NA]	[[NA] NA]		NA] NA]		[[]	*
COMPARE	[/]	[]	[]	[]		[]	
RECOMME	NDA'	ΓI	ONS	: (If d	iffere	ent f	from N	ASA)					
	[/]	[]	[]	[]	(A	[DD/E) ELE	TE)
* CIL R	ete:	NT:	ION	RATI	ONALI	E: (If	app	olicab	•	ADEQI JADEQI]]	

REMARKS:

ASSESSME ASSESSME NASA FME	NT :	ID:		-824X	NASA DATA: BASELINE [NEW [X							
SUBSYSTE MDAC ID:			824	&C/MPS MANIF		REPRI	ess v	'ALVI	s circ	UIT	FUS	E (2)
LEAD ANA	LYS'	T:	В.	SLAUGH	TER							
ASSESSME	NT:											
		TICAL FLIGH	r			DANC!	Y SCR	REENS	s c		CIL	
		DW/FU					-					
NASA IOA	[3 /3 3 /3]	N]	A] A]	[]	NA] NA]	[NA] NA]		[] *]
COMPARE	[/]	ĺ]	[1	[]		[]
RECOMMEN	IDAT	ions:	(If dif	fere	nt f	rom N	IASA)	ı			
	C	/]	[]	[]	[]	(A	[DD/E] ELETE)
* CIL RE		TION	RATI	ONALE:	(If	appi	licab	-	ADEQUA NADEQUA		[]
CLIMAND												

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	2/04/88 MPS-825X 2312-2	1	NASA DATA: BASELINE [NEW [x]
	EPD&C/MPS 825 LO2 MANIFOLD R	REPRESS VALVE	S TOGGLE SW	ІТСН
LEAD ANALYST:	B. SLAUGHTER			
ASSESSMENT:				
CRITICALI FLIGHT HDW/FUN	ľ	B B		IL TEM
NASA [1 /1 IOA [1 /1] [NA]] [NA]	[NA] [NA]	NA] [AN] [AN	X] * X]
COMPARE [/] []	[] [] []
RECOMMENDATIONS:	(If differen	nt from NASA)		
[/] []	[] [] /DELETE
* CIL RETENTION F	RATIONALE: (If		ADEQUATE [ADEQUATE []

ASSESSMENT DI ASSESSMENT II NASA FMEA #:	D:	2/04/8 MPS-82 2313-2	6X					ASA DATA BASELINE NEW	[
SUBSYSTEM: MDAC ID: ITEM:		EPD&C/ 826 LO2 MA			REPRE	SS VA	LVES	CIRCUIT	нг)C	III	(2)
LEAD ANALYST	:	B. SLA	UGH	TER								
ASSESSMENT:												
	ICALI LIGHT	TY	R	EDUNI	DANCY	SCRE	ENS		CI	L	ſ	
		ic	A		В		С					
NASA [2 IOA [2	/1R /1R]	[P]	[P]	[P [P]	[X X] *	
COMPARE [/]	[]	[]	ſ]	[]	
RECOMMENDATION	ons:	(If	dif	fere	nt fr	om NA	SA)					
[/	1	[]	[]	[] (A		'DE] LET	E)
* CIL RETENT	ION F	RATIONA	LE:	(If	appl	icabl	Al	DEQUATE DEQUATE	[]	
REMARKS:												

ASSESSMENT ASSESSMENT NASA FMEA	ID:	2/04/88 MPS-8271 N/A	K		NASA DATA BASELINE NEW]
SUBSYSTEM: MDAC ID: ITEM:		EPD&C/MI 827 LO2 MAN		EPRESS VAI	LVES CIRCUIT	MDM	OA3
LEAD ANALY	ST:	B. SLAUC	SHTER				
ASSESSMENT	? :						
	RITICALI FLIGHT	r		ANCY SCREI		CIL ITE	M
	HDW/FU	NC	A	В	С		
NASA [IOA [3 /3] [NA]	[] [NA]	[NA]	[] *]
COMPARE [N /N] [N]	[N]	[N]	C]
RECOMMENDA	ATIONS:	(If d	ifferent	t from NAS	SA)		
[3 /3] [NA]	[NA]		[DD/D1] ELETE
* CIL RETE	ENTION I	RATIONAL	E: (If a	applicable	adequate]]
REMARKS:						L	,

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	2/04/88 MPS-828X 2310-1		NASA DAT. BASELIN NE	E []
SUBSYSTEM: MDAC ID: ITEM:	EPD&C/MPS 828 LH2 MANIFOL	D REPRESS	VALVES CIRCUI	T FUSE
LEAD ANALYST:	B. SLAUGHTE	R		
ASSESSMENT:				
CRITICAL: FLIGH HDW/FU	r	UNDANCY SO	CREENS C	CIL ITEM
NASA [3 /3 IOA [3 /3] [NA]	[NA] [NA]	[NA] [NA]	[] *
COMPARE [/] []	[]	[]	[]
RECOMMENDATIONS:	(If diffe	rent from	NASA)	
[/] []	[]	[]	[] ADD/DELETE
* CIL RETENTION I	RATIONALE: (If applica	able) ADEQUATE INADEQUATE	

ASSESSME ASSESSME NASA FME	TK	II		MPS	04/88 5-8292 64-1	ζ.	NASA DATA: BASELINE [NEW [X					x]	
SUBSYSTE MDAC ID:				829	D&C/MI 9 2 MANI		REPI	RESS	VALVE	S TOGGLI	E SWI	тсн	
LEAD ANA	LYS	ST:	:	в.	SLAUC	SHTER							
ASSESSME	ENT	:											
	CR:		CAL LIGH	ITY T		REDU	NDANG	CY SC	REENS		CI IT	L EM	
	1	HDV	V/FU	NC		A		В		С			
NASA IOA	[3 3	/3 /3]	[NA] NA]	[NA] NA]	[NA] NA]]]	*
COMPARE	[/]	(]	[]	[]	[]	
RECOMME	NDA'	ri	ons:		(If d	iffer	ent :	from	NASA))			
	[/	3	[]	[]	[1	[(ADD/	DELE	TE)
* CIL R	ETE:	NT:	ION	RAT	IONAL	E: (I	f ap	plica		ADEQUAT NADEOUAT	_]	

REMARKS:

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	2/04/88 MPS-830X 2065-1		NASA DATA BASELINE NEW	- ·
SUBSYSTEM: MDAC ID: ITEM:	EPD&C/MPS 830 LH2 MANIFOLD	REPRESS VA	LVES CIRCUIT	HDC III (2)
LEAD ANALYST:	B. SLAUGHTER			
ASSESSMENT:				
CRITICALI FLIGHT	נ	DANCY SCRE		CIL ITEM
HDW/FUN	IC A	В	С	
NASA [3 /3 IOA [3 /3] [NA]] [NA]	[NA] [NA]	[NA] [NA]	[] *
COMPARE [/] []	[]	[]	[]
RECOMMENDATIONS:	(If differe	nt from NA	SA)	
\]] []	[]	[]	[] DD/DELETE)
* CIL RETENTION F	RATIONALE: (If	applicabl	e) ADEQUATE INADEQUATE	[]

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	2/04/88 MPS-831X N/A		NASA DATA: BASELINE NEW	
SUBSYSTEM: MDAC ID: ITEM: OA2	EPD&C/MPS 831 LH2 MANIFOLD R	EPRESS VALV	ES CIRCUIT	MONITOR MDM
LEAD ANALYST:	B. SLAUGHTER			
ASSESSMENT:				
CRITICAL FLIGHT HDW/FUI	r	ANCY SCREEN	s C	CIL ITEM
NASA [/ IOA [3 /3] []] [NA]	[] [[NA]	NA]	[] *
COMPARE [N /N] [N]	[N]	N]	[]
RECOMMENDATIONS:	(If differen	t from NASA)	
[3 /3] [NA]	[NA] [NA]	[] DD/DELETE)
* CIL RETENTION	RATIONALE: (If		ADEQUATE NADEOUATE	[]

REMARKS:

	2/03/88 MPS-832 2135-1	x			
SUBSYSTEM: MDAC ID: ITEM:	EPD&C/M 832 TRANSIE	PS NT SUPPRE	SSION DIO	DE	
LEAD ANALYST:	B. SLAU	GHTER			
ASSESSMENT:					
CRITICAL FLIGH		REDUNDAN	CY SCREEN	S	CIL ITEM
HDW/FU	NC	A	В	С	
NASA [3 /3 IOA [3 /1R] [NA] [P] [NA] [F] [NA] P]	[X] *
COMPARE [/N] [N] [N] [n]	[N]
RECOMMENDATIONS:	(If d	ifferent	from NASA)	
[3 /1R	.] [P] [F] [[A] DD/DELETE)
* CIL RETENTION	RATIONAL	E: (If ap		ADEQUATE NADEQUATE	[]
REMARKS: FAILURES COULD L	EAD TO G	ROUNDING	OF THE OP	EN POWER SO	

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	MPS-833X	MPS-833X BASELINE []					
SUBSYSTEM: MDAC ID: ITEM:	EPD&C/MPS 833 TOGGLE SWITCH, 2P3T (3)						
LEAD ANALYST:	B. SLAUGH	B. SLAUGHTER					
ASSESSMENT:							
CRITICAL FLIGH	ns	CIL ITEM					
HDW/FU	NC A		В	С			
NASA [3 /1R IOA [3 /1R] [P] [P] [NA] NA]	[P] [P]	[] *		
COMPARE [/] [] []	[]	[]		
RECOMMENDATIONS:	(If dif	ferent 1	from NAS	A)			
1] [] [1	[] (A)	[] DD/DELETE)		
* CIL RETENTION	* CIL RETENTION RATIONALE: (If applicable) ADEQUATE [] INADEQUATE []						
REMARKS: NASA CALLS LOSS (22206 2.3.3L REQ IN AN ENGINE SHIP	UIRES ASSI		GINE A	REDUNDANT F	AILURE. NSTS		

ONLY AVAIL REF: MPS/EPDC FMEA REVIEW SUMMARY 8-17-88.

ASSESSMEI ASSESSMEI NASA FME	NT ID:		MPS-834X BASELINE []					
SUBSYSTEM MDAC ID:		EPD&C/1 834 HYBRID		TYPE I (6)			
LEAD ANA	LYST:	B. SLA	UGHTER					
ASSESSME	NT:							
CRITICALITY REDUNDANCY SCREENS						CIL ITEM		
	FLIGH HDW/F		A	В	С	TIEM		
NASA IOA	[3 /1] [3 /3	R]	[P] [NA]	[P] [NA]	[P] [NA]	* [] []		
COMPARE	[/N]	[N]	[N]	[N]	[]		
RECOMMEN	DATIONS	: (If	differen	t from NA	ASA)			
	[3 /3]	[NA]	[NA]	[NA]	[] ADD/DELETE)		
* CIL RETENTION RATIONALE: (If applicable)								
					ADEQUATE INADEQUATE	•		
REMARKS: NASA ASS	_	HELIUM L	EAK WHIC	H IS CRIT	CICALITY 1/1	BY ITSELF TO		

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	MPS-835X	MPS-835X BASELINE []					
MDAC ID:	EPD&C/MPS 835 REMOTE POWER CO	ONTROLLER (6)				
LEAD ANALYST:	B. SLAUGHTER						
ASSESSMENT:							
CRITICALI FLIGHT	CIL ITEM						
HDW/FUN		В	С				
NASA [3 /1R IOA [3 /3] [P]] [NA]	[P] [[NA] [P] NA]	[] *			
COMPARE [/N] [N]	[N] [N]	[]			
RECOMMENDATIONS:	(If different	from NASA)				
[3 /3] [NA]	[NA] [[] DD/DELETE)			
* CIL RETENTION F	RATIONALE: (If a	applicable)	ADEQUATE	r 1			
REMARKS:		I	NADEQUATE				
NASA ASSUMES A HE GET THEIR 1R.	ELIUM LEAK WHICH	H IS CRITIC	ALITY 1/1 H	BY ITSELF TO			

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	MPS-836	MPS-836X BASELINE						
SUBSYSTEM: MDAC ID: ITEM:	836	EPD&C/MPS 336 ISOLATION DIODES (6)						
LEAD ANALYST: B. SLAUGHTER								
ASSESSMENT:								
CRITICA: FLIG		REDUNDAN	CY SCREEN	rs.	CIL ITEM			
		A	В	С				
NASA [3 /1: IOA [3 /1:	R] [P] [P] [F] [P] [P] P]	[X] *			
COMPARE [/] [] [и] [и]	[N]			
RECOMMENDATIONS	: (If d	ifferent	from NASA	7)				
[3 /1	R] [P] [P] [[P] (A	[D] DD/DELETE)			
* CIL RETENTION	RATIONAL	E: (If ap		ADEQUATE	[]			
REMARKS: THE NASA SCENAR MISSION). THE 2.3.3L REQUIRES ENGINE SHUTDOWN	SHORT TO ASSIGNME	GROUND WI	OF ONE F	ENGINE (LOS	S OF TS 22206			

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	MPS-837	MPS-837X BASELINE					
MDAC ID:	837	EPD&C/MPS 837 ISOLATION DIODES					
LEAD ANALYST:	YST: B. SLAUGHTER						
ASSESSMENT:							
CRITICAL FLIGH		REDUNDA	NCY SCRE	ens	CIL ITEM		
HDW/FU	NC	A	В	С			
NASA [3 /3 IOA [3 /1R] [NA] P]	[NA] [F]	[NA] [P]	[] * [x]		
COMPARE [/N] [и ј	[א]	[N]	[N]		
RECOMMENDATIONS:	(If d	ifferent	from NAS	SA)			
[3 /1R] [P]	[F]		[A] DD/DELETE)		
* CIL RETENTION	RATIONALI	E: (If ap	plicable				
REMARKS:				ADEQUATE INADEQUATE			
THE LOSS OF ONE I	ENGINE CO	OULD RESU		L REDUNDANC			
REQUIRES ASSIGNMI	ENT OF 3	'IR FOR I	AILURES	RESULTING II	N AN ENGINE		

SHUTDOWN.

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	2/05/88 MPS-838X 2146-2	NASA DATA: X BASELINE [] NEW [X]				
SUBSYSTEM: MDAC ID: ITEM:	EPD&C/MPS 838 ISOLATION DIOD	ES				
LEAD ANALYST:	B. SLAUGHTER					
ASSESSMENT:						
CRITICAL: FLIGHT		ANCY SCREEN	IS	CIL ITEM		
HDW/FUI		В	С			
NASA [3 /3 IOA [3 /3] [NA]] [NA]	[NA] [NA]	[NA] [NA]	[] *		
COMPARE [/] []	[]	[]	[]		
RECOMMENDATIONS:	(If differen	t from NAS	A)			
[/] []	[]	[] (A)	[] DD/DELETE		
* CIL RETENTION REMARKS:	RATIONALE: (If) ADEQUATE INADEQUATE	[]		

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	2/15/88 MPS-9013 0602-5	2/15/88 NASA DATA MPS-901X BASELINE 0602-5 NEW					
	MPS 901 LO2 MAN	MPS 901 LO2 MANIFOLD REPRESS REGULATOR (PR5)					
LEAD ANALYST:	W.J. MC	W.J. MCNICOLL					
ASSESSMENT:							
CRITICA FLIG		REDUNDANC	Y SCREENS		CIL TEM		
	INC	A	в с	-			
NASA [3 /11 IOA [2 /11	R] [P] [P] [F] [P F] [P] [x] *		
COMPARE [N /] [] [] [] [[и]		
RECOMMENDATIONS	(If d	ifferent f	rom NASA)				
[2 /1]	?] [P] [F] [P] D/DELETE)		
* CIL RETENTION	RATIONAL	E: (If app	A!	DEQUATE [DEQUATE [[] []		
INADEQUATE [] REMARKS: REGULATOR WILL REMAIN OPEN, PRESSURIZING THE MANIFOLD. FAILURE OF RELIEF SYSTEM DURING ENTRY MAY CAUSE MANIFOLD RUPTURE. NO HAZARD DURING DUMP PRESSURIZATION. REF: RI/NASA CIL OF 12-23-87 AND RI/NASA FMEA/CIL REVIEW MEETING NOTES.							

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	2/15/88 NASA DATA MPS-902X BASELINE 0629-2 NEW]		
SUBSYSTEM: MDAC ID: ITEM:	MPS 902 LH2 MAN							
LEAD ANALYST:	W.J. MCNICOLL							
ASSESSMENT:								
CRITICALITY REDUNDANCY SCREENS C						M.		
HDW/FU	NC	A	В	С				
NASA [3 /3 IOA [3 /1R] [NA] [P] [NA] P]]] *		
COMPARE [/N] [и ј [N] [N]	(]		
RECOMMENDATIONS:	(If d	ifferent i	from NASA)				
[3 /1R] [P] [P] [P] (Al	[ID/DD] ELETE)		
* CIL RETENTION	RATIONAL	E: (If apr	olicable)					
				ADEQUATE NADEQUATE]		
THREE FAILURES M LH2 MANIFOLD. N	REMARKS: THREE FAILURES MUST OCCUR BEFORE HELIUM WILL BE INJECTED INTO THE							

MANIFOLD OVERPRESSURIZATION AND RUPTURE.

ASSESSMENT ID: NASA FMEA #:				BASELINE NEW	-			
	903	HELIUM	SUPPLY RI	ELIEF VALVI	E (RV4)			
LEAD ANALYST:	W.J. MCNI	COLL						
ASSESSMENT:								
CRITICALI FLIGHT		EDUNDANC	Y SCREENS	5	CIL ITEM			
HDW/FU	IC A	:	B	С				
NASA [1 /1 IOA [1 /1] [NZ	A] [] A] []	NA] [NA] [NA] NA]	[X] *			
COMPARE [/] [] [J []	[N]			
RECOMMENDATIONS:	(If dif:	ferent f	rom NASA)					
[/] [] [] [[] DD/DELETE)			
* CIL RETENTION F	RATIONALE:	(If app	•	ADEQUATE	[]			
REMARKS: REF: RI/NASA CII NOTES.	OF 12-23-	-87 AND I		ADEQUATE	[] [] :VIEW MEETIN			

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	MPS-904X	NASA DATA: BASELINE [] NEW [X]						
	MPS 904 LH2 FEEI							
LEAD ANALYST:	W.J. MCNICOLL							
ASSESSMENT:								
CRITICAL		REDUNDANC	CY SCREENS	5	CIL ITEM			
FLIGH HDW/FU	_	A	В	С	110.			
NASA [2 /1R IOA [2 /1R] [P] [P] [F] [F] [P] P]	[X] *			
COMPARE [/] [] [] []	[N]			
RECOMMENDATIONS:	(If d	ifferent :	from NASA)				
[/] [] [] [] (A)	[] DD/DELETE)			
* CIL RETENTION RATIONALE: (If applicable) ADEQUATE [] INADEQUATE []								
REMARKS: REF: RI/NASA CI NOTES.	L OF 12-	REMARKS: REF: RI/NASA CIL OF 12-23-87 AND RI/NASA FMEA/CIL REVIEW MEETING						

ASSESSMI ASSESSMI NASA FMI	ENT I	D:	MPS-	MPS-905X BASELINE []						
SUBSYSTE MDAC ID:			MPS 905 PNEU							
LEAD ANA	ALYST	:	W.J. MCNICOLL							
ASSESSMI	ENT:									
CRITICALITY REDUNDANCY SCREENS FLIGHT						CIL ITEM				
				A		В	(С	TIEM	
NASA IOA	[1	/1 /1]	[NA [NA] [NA] NA]	[]	NA] NA]	[X] * []	
COMPARE	[/]	[] []	[]	[и]	
RECOMMEN	NDATI	ons:	(I	f diff	erent	from N	ASA)			
	[/]	[] []	[1	[] (ADD/DELETE)	
* CIL RETENTION RATIONALE: (If applicable) ADEQUATE [] INADEQUATE []										
REMARKS: REF: RI NOTES.	-	A CI	L OF	12-23-	87 AND	RI/NA			L REVIEW MEETING	

ASSESSME ASSESSME NASA FME	NT I	D:	MPS-	906X		NASA DATA: BASELINE [] NEW [X]					
SUBSYSTE MDAC ID: ITEM: LV1,2,3,			MPS 906 ENGI	NE HELI	UM LINE	(CV25	,26,36,37,	41,42	то		
LEAD ANA	LYST	':	W.J.	MCNICO	LL						
ASSESSME	NT:										
CRITICALITY REDUNDA FLIGHT								CIL ITEM			
	HD	W/FU	NC	A	В		С				
NASA IOA	[1	/1]	[NA] [NA]	[N. [N.	A] A]	[NA] [NA]	[X [] *]		
COMPARE	[/]	[]	[]	[]	[N]		
RECOMMEN	DATI	ons:	(1	f diffe	rent fr	om NAS	A)				
	[/]	[]	[1	[] ([ADD/DE			
* CIL RE		NOI	RATIC	ONALE: (If appl) ADEQUATE INADEQUATE	[]		
REMARKS: REF: RI		A CI	L OF	12-23-8	7 AND R	I/NASA	FMEA/CIL	REVIEW	MEETING		

ASSESSMENT ID: NASA FMEA #:			NASA DATA BASELINE NEW	
	MPS 907 ENGINE HELI	TUM SUPPLY LIN	E (LV1,2,3,4	4 TO
LEAD ANALYST:	W.J. MCNICO	OLL		
ASSESSMENT:				
CRITICAL: FLIGHT HDW/FU	r	DUNDANCY SCREEN B	1S C	CIL ITEM
NASA [1 /1 IOA [1 /1] [NA]	[NA] [[NA] [NA]	[X] *
COMPARE [/] []	[]]	[N]
RECOMMENDATIONS:	(If diffe	rent from NASA	7)	
[/] []	[] [[] (AD	[] DD/DELETE)
* CIL RETENTION F	RATIONALE: (ADEQUATE NADEQUATE	[]
	OF 12-23-8	7 AND RI/NASA	FMEA/CIL RE	VIEW MEETING

ASSESSMEN ASSESSMEN NASA FMEN	NT ID		MPS-9	/16/88 NASA DATA: PS-908X BASELINE [] 111-1 NEW [X]										
SUBSYSTEMDAC ID: ITEM: CV5,6,7,				08 NGINE HELIUM SUPPLY LINE (PR1,2,3,7,8,9 TO										
LEAD ANA	LYST:	:	w.J.	MCN	COLL									
ASSESSME	NT:													
CRITICALITY REDUNDANCY SCREENS CIL FLIGHT ITEM														
	HDV	/FU	NC	а в с										
NASA IOA	[1 [1	/1 /1]	[]	NA] NA]	[[NA] NA]	[[NA] NA]		[X]	*
COMPARE	[/]	[1	ſ]	[]		[N]	
RECOMMEN	DATI	ons:	(I	f di	ffere	nt i	from N	ASA)					
	[/]	[]	[]	[]	(A		/ DI		ETE)
* CIL RE	TENT	ION	RATIC	NALE	: (If	ap)	plicab		ADEQUA NADEQUA	ATE ATE	[]	
REMARKS: REF: RI NOTES.	/NAS	A CI	L OF	12-2	3-87	AND	RI/NA	SA	FMEA/C	IL R	EV:	ΙEΊ	N N	MEETING

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	MPS-909X	:		NASA DATA BASELINE NEW						
MDAC ID:	MPS 909 ENGINE H									
LEAD ANALYST:	W.J. MCN	ICOLL								
ASSESSMENT:										
CRITICALITY REDUNDANCY SCREENS CIL FLIGHT ITEM										
HDW/FU	NC .	A	В	С						
NASA [1 /1 IOA [1 /1] [NA] [AN] [NA] [NA] [NA]	[X] * []					
COMPARE [/] [] [3 (]	[и]					
RECOMMENDATIONS:	(If di	fferent f	rom NASA	7)						
[/] [] [) ([] (AI	[] DD/DELETE)					
* CIL RETENTION RATIONALE: (If applicable) ADEQUATE [] INADEQUATE []										
REMARKS: REF: RI/NASA CII NOTES.	L OF 12-2	3-87 AND			EVIEW MEETING					

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	MPS-9102	IPS-910X BASELINE []								
SUBSYSTEM: MDAC ID: ITEM: CV27,38,43)	MPS 910 HELIUM									
LEAD ANALYST:	W.J. MC	NICOLL								
ASSESSMENT:										
CRITICAL FLIGH HDW/FU		REDUNDANC A	SCREENS B C		CIL ITEM					
NASA [1 /1 IOA [1 /1] [NA] [NA] [NA] [NA NA] [NA	A] A]	[X] * []					
COMPARE [/] [] [] []	[N]					
RECOMMENDATIONS:	(If d	ifferent 1	from NASA)							
[/] [] [] [] (AD	[DD/DELETE)					
* CIL RETENTION	RATIONAL	E: (If app	A	DEQUATE DEQUATE	[]					
REMARKS: HAZARD EXISTS WHEN INTERCONNECT IN VALVES ARE OPEN (MECO TO MECO+20 SEC). AT ALL OTHER TIMES, THIS FAILURE IS 2/1R. REF: RI/NASA CIL OF 12-23-87 AND RI/NASA FMEA/CIL REVIEW MEETING NOTES.										

ASSESSM ASSESSM NASA FM	ENT	ID:	MPS	6/88 - 911 6-1									
SUBSYST MDAC ID ITEM: CV28,39	:		MPS 911 HEL	IUM 1	(NTER	CONN	ECT O	UT L	INE (L	V60,	62,6	54 TO	
LEAD AN	ALYS	ST:	W.J	. MCN	ICOL	<u></u>							
ASSESSM	ENT:	;											
	CRI	TICA:	LITY HT		REDUI	IDAN(CY SCF	REENS	5		CIL		
	H	IDW/F	UNC		A		В		С		IIE	М	
NASA IOA]	1 /1 1 /1]] [NA] NA]]	NA]	[[NA] NA]		[X] *]	
COMPARE	[/]	[]	ſ]	[]		[N]	
RECOMMEN	IDAT	'IONS	: (1	f di	ffere	nt f	rom N	ASA)					
	[/]	[)	[]	[]	(Al	[] ELETE)
* CIL RE	TEN	TION	RATIO	NALE	: (If	app	licab	le)					
REMARKS:			,						ADEQUA ADEQUA		[]	
HAZARD E SEC). W REF: RI NOTES.	UTN	Inc	VALVE	S AR	E CLO	SED.	THTS	דגד	TIIDE T	· C	/1 D		ring

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	2/17/88 MPS-912X 0704-1		1	NASA DATA: BASELINE NEW	[] [x]
SUBSYSTEM: MDAC ID: ITEM:	MPS 912 HELIUM M	ETALLIC B	oss seals	(K SEALS)	
LEAD ANALYST:	W.J. MCN	ICOLL			
ASSESSMENT:					
CRITICAL		REDUNDANC	CY SCREENS	•	CIL ITEM
FLIGH HDW/FU		A	В	С	
NASA [1 /1 IOA [1 /1] [NA] [NA] [NA] [NA] [NA] NA]	[X] *
COMPARE [/] [] [] []	[N]
RECOMMENDATIONS:	(If d	ifferent :	from NASA))	
[/] [] [] [] (A)	[] DD/DELETE)
* CIL RETENTION	RATIONAL	E: (If ap		ADEQUATE NADEQUATE	
REMARKS: REF: RI/NASA C 87.	IL OF 12-	23-87 AND	RI/NASA	CIL WORKSH	EET OF 10-15-

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	MPS-913X		NASA DATA BASELINE NEW	
MDAC ID:	MPS 913 NAFLEX HELIUM	TANK SEALS	(FOR TK4)	
LEAD ANALYST:	W.J. MCNICOLL			
ASSESSMENT:				
CRITICAL: FLIGHT		DANCY SCREEN	S	CIL
HDW/FUI		В	С	ITEM
NASA [1 /1 IOA [1 /1] [NA]] [NA]	[NA] [[NA] [NA] NA]	[X] *
COMPARE [/] []	[] []	[N]
RECOMMENDATIONS:	(If differer	nt from NASA)	
1] []	[] [[] DD/DELETE)
* CIL RETENTION E	RATIONALE: (If	,	ADEQUATE NADEQUATE	
REMARKS: REF: RI/NASA CII NOTES.	L OF 12-23-87 A	ND RI/NASA	FMEA/CIL RE	EVIEW MEETING

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	MPS-914X	PS-914X BASELINE []							
MDAC ID:	MPS 914 COMBINATI	ON HELIUM TANK	SEALS (FOR T	TK6, 8, 10)					
LEAD ANALYST:	W.J. MCNI	COLL							
ASSESSMENT:									
		REDUNDANCY SCREE	ens	CIL ITEM					
FLIGH HDW/FU	nc A	В	С	TIEM					
NASA [1 /1 IOA [1 /1] [N	IA] [NA] IA] [NA]	[NA] [NA]	[X] *					
COMPARE [/] [] []	[]	[N]					
RECOMMENDATIONS:	(If dif	fferent from NAS	SA)						
[/] [] []	[] (A)	[] DD/DELETE)					
* CIL RETENTION	RATIONALE:	: (If applicable	≘) ADEQUATE INADEQUATE	[]					
REMARKS: REF: RI/NASA CI NOTES.	L OF 12-23	3-87 AND RI/NAS	A FMEA/CIL R	EVIEW MEETING					

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	MPS-915X		NASA DATA BASELINE NEW						
	915	ELIUM SUPPLY PRES	SSURE TRANSI	DUCERS (3)					
LEAD ANALYST:	W.J. MCNI	COLL							
ASSESSMENT:									
CRITICALITY REDUNDANCY SCREENS CIL FLIGHT									
	IC A	В	С	ITEM					
NASA [3 /1R IOA [3 /1R] [P	[F] [F] [F]	P] P]	[X] *					
COMPARE [/] [] [] []	[N]					
RECOMMENDATIONS:	(If dif:	ferent from NASA	.)						
1] [] [] [[] DD/DELETE)					
* CIL RETENTION R	RATIONALE:	(If applicable)							
		I	ADEQUATE NADEQUATE	[]					
REMARKS: THERE ARE FOUR PR SAME PRESSURE DUR UNDERFILL AND LOS INDICTOR(S) DURIN REF: RI/NASA CIL NOTES.	ING FILL. S OF VEHIC G ASCENT W	FAILURE OF ALL CLE DURING ASCEN WILL HAVE NO EFF	FOUR CAN C T. FAILURE ECT.	AUSE T ANK OF					

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	MPS-916X			NASA DATA: BASELINE NEW	
MDAC ID:	MPS 916 PNEUMATIO	C HELIUM	SUPPLY P	RESSURE TRA	NSDUCER
LEAD ANALYST:	W.J. MCN	COLL			
ASSESSMENT:					
	ITY I	REDUNDANC	Y SCREEN	S	CIL ITEM
FLIGH HDW/FU		A	В	С	
NASA [3 /1F IOA [3 /1F		P] [P] [F] [F] [P] P]	[X] * []
COMPARE [/] [] [] []	[N]
RECOMMENDATIONS	(If di	fferent f	rom NASA	.)	
[/] [] [] [] (Al	[] DD/DELETE)
* CIL RETENTION	RATIONALE	: (If app		ADEQUATE NADEQUATE	
REMARKS: FOUR PRESSURE TO SHOULD INDICATE ALL FOUR CAN CAN ASCENT. FAILURE EFFECT. REF: RI/NASA CONOTES.	THE SAME USE TANK U E OF INDIC	PRESSURE INDERFILL CATOR(S) I	DURING TAND LOSS	S OF VEHICLES CENT WILL	FAILURE OF E DURING HAVE NO

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:			NASA DATA: BASELINE [] NEW [X]							
MDAC ID:	MPS 917 ENGINE HELI									
LEAD ANALYST:	W.J. MCNICO	OLL								
ASSESSMENT:										
CRITICALITY REDUNDANCY SCREENS CIL FLIGHT ITEM										
	NC A	В	С	TIEM						
NASA [3 /1R IOA [3 /1R] [P]	[F] [] [F] [P] P]	[X] *						
COMPARE [/] []] [] []	[N]						
RECOMMENDATIONS:	(If diffe	erent from NASA	.)							
[3 /3] [NA]] [AN] [[D] DD/DELETE)						
* CIL RETENTION I	RATIONALE: ((If applicable)								
		I	ADEQUATE NADEQUATE							
REMARKS: FAILURE OF TRANSI LEAK IS NOT A LOS			NO REDUND	ANCY. A						
		BANCY. B7 AND RI/NASA	FMEA/CIL RE	VIEW MEETING						

ASSESSME ASSESSME NASA FME	NT	II):	MP	PS-918X BASELINE []													
SUBSYSTE MDAC ID: ITEM: TRANSDUC				MP 91 PN								E						
LEAD ANA	LYS	ST	:	w.,	J. N	IC)	1IC	OLL										
ASSESSME	NT:	:																
CVIIIONETI INDUINICE CONTENT									CIL ITEM									
	ŀ		/FU				A			В			С				-	
NASA IOA	[3	/1R /1R]		[P P]	[F F]	[P P]	[X]	*
COMPARE	[/]		[]	[]	[]	[N]	
RECOMMEN	IDA!	ΓI	ons:		(If	đ:	iff	eren	t	fro	om NA	ASA))					
	(3	/3]		[NA	\]	[NZ	A]	[NZ	A] (A	DD,	ם ום/		ETE)
* CIL RE	TE	NT:	ION	RAT	ION	ALJ	E:	(If	ap	pl:	icab]			DEQUATE DEQUATE]	
REMARKS: FAILURE OF TRANSDUCER WILL HAVE NO EFFECT. NO REDUNDANCY. A LEAK IS NOT A LOSS OF REDUNDANCY. REF: RI/NASA CIL OF 12-23-87 AND RI/NASA FMEA/CIL REVIEW MEETING NOTES.																		

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	2/17/88 MPS-919X 0626-12		NASA DATA BASELINE NEW	
	919	CUMULATOR	PRESSURE TRANSDU	CER
LEAD ANALYST:	W.J. MCNI	COLL		
ASSESSMENT:				
FLIGHT		REDUNDANCY	SCREENS	CIL ITEM
HDW/FUN	IC A	В	С	
NASA [3 /1R IOA [3 /1R] [P] [P	[F] [P]] [P]	[X] * []
COMPARE [/] [] [] []	[N]
RECOMMENDATIONS:	(If dif:	ferent from	m NASA)	
			(AD	[D] DD/DELETE)
* CIL RETENTION R	ATIONALE:	(If applie		
REMARKS:			ADEQUATE INADEQUATE	
TRANSDUCER FAILURI IS NOT A LOSS OF I	REDUNDACY.	_		
REF: RI/NASA CIL NOTES.	OF 12-23-	-87 AND RI/	/NASA FMEA/CIL RE	VIEW MEETING

ASSESSMEN ASSESSMEN NASA FME	T T	D:	2/17, MPS-1 0627	S-920X DASEBIND []													
SUBSYSTEM MDAC ID:	1 :		MPS 920 ENGI	NE H	EL:	UM S	UP	PL	T Y.	EMPE	RA	TURE 7	FRA	NSDU	CE	RS	(6)
LEAD ANA	LYSI	r:	W.J.	MCN	IIC	OLL											
ASSESSME	NT:																
		rical Fligh			RE	REDUNDANCY SCREENS					CIL	Ī					
	-	DW/FU			A			В			С						
NASA IOA		3 /1R 3 /1F]	[P P]	[P P]	[P P]		[]	*	
COMPARE	(/]	[]	[]	[]		[]		
RECOMMEN	DAT	ions:	: (]	[f d	iff	eren	t :	fr	om 1	ASA)						
	[/]	[]	[]	ĵ]	(A)	[DD/D] ELE	TE)
* CIL RE	ETEN	TION	RATIO	ONAL	E:	(If	ap:	pl	ical		A.	DEQUAT DEQUAT		[]		
MULTIPLI LIMITS	REMARKS: MULTIPLE FAILURE OF TRANSDUCERS MAY ALLOW STRUCTURAL TEMPERATURE LIMITS TO BE VIOLATED DURING TANK FILL AND CAUSE RUPTURE AND LOSS OF VEHICLE. FAILURE DURING ASCENT WILL HAVE NO EFFECT. REF: RI/NASA FMEA/CIL REVIEW MEETING NOTES.																

ASSESSM ASSESSM NASA FM	ENT :			: MPS-921X BASELINI			NASA DATA: SASELINE NEW					
SUBSYST MDAC ID ITEM:			MPS 921 PNE		C HEI	LIUM :	SUPPI	LY TI	EMPERATURI	E TR	ANSDUCER	
LEAD AN	ALYS	r:	W.J	. MCN	ICOLI							
ASSESSMI	ENT:											
CRITICALITY REDUNDANCY SCREENS CIL FLIGHT ITEM HDW/FUNC A B C												
		W/FU	NC		A	ŀ	3		С			
NASA IOA	[3	3 /3]	[NA] NA]	[]	IA] IA]]	NA] NA]	[] *]	
COMPARE	[/]	[]	[]	[]	[]	
RECOMMEN	IDATI	ons:	()	If di	ffere	nt fr	om N	ASA)				
	[/	1	[1	[]	[] (A] DELETE)	
* CIL RE		ION :	RATIO	ONALE	: (If	appl	icab	•	ADEQUATE ADEQUATE	[]	
REF: RI	/NAS	A FM	EA/CI	L RE	VIEW :	MEETI	NG N	OTES	•			

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	2/17/88 MPS-9227 0409-4	ζ.		NASA DATA: BASELINE [] NEW [X]				
ADAC ID.	MPS 922 GN2 PURG	GE DISCON	NECT (PD	L4)				
LEAD ANALYST:	W.J. MCI	NICOLL						
ASSESSMENT:								
CRITICAL FLIGH		REDUNDAN	ICY SCREE	NS	CIL ITEM			
HDW/FU		A	В	С				
NASA [1 /1 IOA [1 /1] [NA] [NA]	[NA] [NA]	[X] *			
COMPARE [/] []	[]	[]	[N]			
RECOMMENDATIONS:	(If d	ifferent	from NAS	A)				
[/] [1	[]	[]	[] .DD/DELETE)			
* CIL RETENTION	RATIONAL	E: (If a	pplicable	ADEQUATE	[]			
REMARKS: POSSIBLE OVERPRE REF: RI/NASA CI NOTES.	POSSIBLE OVERPRESSURIZATION AND/OR SHARPNEL DAMAGE. REF: RI/NASA CIL OF 12-23-87 AND RI/NASA FMEA/CIL REVIEW MEETING							

	ASSESSM ASSESSM NASA FM	ENT	'I	D:	M)	/17/88 PS-923 426-1			NASA DATA: BASELINE [] NEW [X]								
	SUBSYSTI MDAC ID ITEM:				92	GN2 PURGE LINE											
	LEAD AND	ALY	ST	:	W.	J. MC	NICOL	L									
	ASSESSMI	ENT	:														
	CRITICALITY REDUNDANCY SCREENS CIL ITEM																
		1	HD	W/FU	NC		A		В		С			TEI	.41		
	NASA IOA	[1	/1 /1]]	NA] NA]	[NA]		NA] NA]		[x]	*	
	COMPARE	[/]	[]	[]	[]		ſ	N	J		
	RECOMMEN	[AD]	ric	ons:		(If di	ffere	ent i	from	NASA)						
		[/]	[]	[]	[]	(A)	[DD/			CTE)	
	* CIL RE	TEN	T	ON I	RAT	IONALE	: (If	app	olica	ıble)							
	REMARKS:										ADEQU NADEQU	ATE	[]		
1		/NA	SA	CI	L O	F 12-2	3-87	AND	RI/N	ASA 1	FMEA/C	IL RI	EVI	EW	M	EETI	NG

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	2/17/88 MPS-924X 0901-1		BASELINE NEW	[x]			
SUBSYSTEM: MDAC ID: ITEM:	MPS 924 STRUCTUF	AL ATTAC	H POINTS				
LEAD ANALYST:	W.J. MCN	ICOLL					
ASSESSMENT:							
CRITICAL FLIGH	T		ICY SCREE	ns C	CIL ITEM		
HDW/FU	NC	A	В	C			
NASA [1 /1 IOA [/] [NA]	[NA] []	[AA] []	[X] *		
COMPARE [N /N] [N]	[и]	[N]	[N]		
RECOMMENDATIONS:	(If d	ifferent	from NAS	A)			
[/] [1	[]	[] (A	[D] DD/DELETE)		
* CIL RETENTION	RATIONAL	E: (If a	pplicable	adequate			
REMARKS: NSTS 22206 2.3.1 0901-1.	l DOES NO	T REQUIR	E A FMEA	FOR STRUCTU	RE. DELETE		

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	MPS-1001		NASA DATA: BASELINE [] NEW [X]					
	MPS 1001 GO2 PRESS	SURE IS	SOLATION	CHECK VALVE	(CV18, 19,			
LEAD ANALYST:	K.A. HOLI	DEN						
ASSESSMENT:								
CRITICALITY REDUNDANCY SCREENS CIL FLIGHT ITEM								
HDW/FU		A	В	С	11211			
NASA [/ IOA [3 /2R] []	P]	[] [F]	[] [P]	* []			
COMPARE [N /N] []	N]	[N]	[N]	[]			
RECOMMENDATIONS:	(If di	fferent	from NA	.SA)				
[/] [1	[]	[]	[] ADD/DELETE)			
* CIL RETENTION	RATIONALE:	: (If a	applicabl	•				
D	ADEQUATE [] INADEQUATE []							
REMARKS: THIS WORKSHEET SHOULD BE COMBINED WITH MPS-1005, WHICH IS THE WORST CASE FOR THIS FAILURE MODE. MPS-1005 MATCHES AND AGREES								

WITH 0514-1. THE VEHICLE'S ACCELERATION HAS A MUCH LARGER EFFECT ON THE LO2 NET POSITIVE SUCTION PRESSURE (NPSP) THAN THE ULLAGE PRESSURE DOES. THEREFORE, NEITHER CAVITATION AT THE LPOT NOR LOSS OF LO2 IS VALID. HOWEVER, THE LOSS OF GO2 ULLAGE PRESSURE CAUSES AN OPPOSITE PRESSURE DIFFERENTIAL THAN WHAT THE LO2 TANK WAS DESIGNED FOR. THIS COULD CAUSE THE LO2 TANK TO BUCKLE DUE TO AERODYNAMIC LOADS ON A TANK WHICH IS NOT PRESSURIZED. THERE ARE 3 SUCH CHECK VALVES.

NASA DATA:

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	1/20/88 MPS-1002 0514-2	NASA DATA: BASELINE [] NEW [X]				
MDAC ID:	MPS 1002 GO2 PRESSURE ISOL	ATION CHECK VALVE	(CV18, 19,			
LEAD ANALYST:	K.A. HOLDEN					
ASSESSMENT:						
FLIGH		CY SCREENS B C	CIL ITEM			
NASA [2 /1R IOA [/NA	[P] [NA] [NA] [P] NA] [NA]	[X] * []			
COMPARE [N /N] [N][] [и]	[N]			
RECOMMENDATIONS:	(If different f	from NASA)				
[3 /1R	[P] [F] [F] (2	[] ADD/DELETE)			
	RATIONALE: (If app	plicable) ADEQUATE INADEQUATE	[]			
DUE TO ULLAGE PF OXIDIZER VALVE, LEVELS OF REDUNI OF LO2 ULLAGE PF BETWEEN THE INSI DESIGNED TO HOLI	RESSURE LOST THROUGH WHICH IS CLOSED DO DANCY TO THIS FAILUTE RESSURE COULD CAUSE IDE AND OUTSIDE OF THE RESULTANT I	WAS ORIGINALLY REPO SH A SHUTDOWN ENGING URING AN ENGINE SHO URE MODE. THE LOSS E A PRESSURE DIFFER THE TANK THAT THE LACK OF PRESSURE IN UE TO THE ATMOSPHER	WE. THE MAIN OTDOWN, ADDS 2 SENTIAL TANK WAS NOT OF THE TANK			

NASA INFORMATION IS BASED ON THE NASA/RI CRITICAL ITEMS LIST OF

12-23-87.

ASSESSMI ASSESSMI NASA FMI	ENT	ID:	1/20 MPS- 0514	1003		NASA DATA: BASELINE [] NEW [X]								
SUBSYSTE MDAC ID: ITEM: 20)			MPS 1003 GO2	1003 SO2 PRESSURE			ATION	СН	ECK VAI	ALVE (CV18, 19,				
LEAD ANALYST: K.A. HOLDEN														
ASSESSME	NT:													
CRITICALITY REDU FLIGHT HDW/FUNC A						INDANCY SCREENS B C					CIL ITEM			
NASA IOA	[1 /1 1 /1]	[] []	IA] IA]	[N	IA] IA]	[NA] NA]]	х ј х ј	*		
COMPARE	[/]	[]	[]	[]	[]			
RECOMMEN	DAT:	ions:	(If	f dif	fere	nt fr	om N	ASA))					
	[/]	[]	[]	[]] /DELE	ΓE)		
* CIL RE	TENT	rion 1	RATION	IALE:	(If	appl	icab		ADEQUA']			
REMARKS: NASA INF 12-23-87	ORMA	ATION	IS BA	SED	ON T	HE RI	/NAS			•	LIST	r of		

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	MPS-1004	S-1004 BASELINE []					
MDAC ID:	MPS 1004 GO2 PRES	SURE ISOI	ATION CH	ECK VALVE	(CV18, 19 20)		
LEAD ANALYST:	K.A. HOI	LDEN					
ASSESSMENT:							
CRITICAL		REDUNDANC	Y SCREENS	S	CIL ITEM		
FLIGH HDW/FU		A	В	С			
NASA [3 /3 IOA [1 /1] [NA] [NA] [NA] [NA] [NA] NA]	[x] *		
COMPARE [N /N] [] [] [1	[N]		
RECOMMENDATIONS:	(If d	ifferent :	from NASA)			
[/] [] [] [] (A	[] DD/DELETE)		
* CIL RETENTION	RATIONAL	E: (If ap	plicable) I	ADEQUATE	[]		
REMARKS: THE HEAT EXCHANGER IN THE SSME IS DESIGNED TO HANDLE O2 AT ABOUT 3700 PSIA. HELIUM LEAKING INTO THE HEAT EXCHANGER AT 20 PSIA WOULD NOT HAVE ANY SIGNIFICANT EFFECT. THEREFORE, IT IS 3/3. NASA INFORMATION IS BASED ON NASA FMEA/CIL REVIEW MEETING NOTES (REF. J. BORCHES).							

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	1/20/88 MPS-1005 0514-1	NASA DATA: BASELINE [] NEW [X]					
SUBSYSTEM: MDAC ID:			CHECK VALVE	(CV18, 19,			
LEAD ANALYST:	K.A. HOLDEN						
ASSESSMENT:							
CRITICALI FLIGHT	CIL ITEM						
	IC A	В	С				
NASA [3 /1R IOA [1 /1] [P]] [NA]	[F] [NA]	[P] [NA]	[X] * [X]			
COMPARE [N /N] [N]	[N]	[N]	[]			
RECOMMENDATIONS:	(If differe	ent from NA	SA)				
[1 /1] [NA]	[NA]		[] DD/DELETE)			
* CIL RETENTION F	RATIONALE: (If	applicabl		_			
DEWI DIEG.			ADEQUATE INADEQUATE				
REMARKS: FAILURE OF THE CH PRESSURE TO RUPTU ENGINE EXPLOSION. CRITICAL ITEMS LI	TRE THE HEAT E NASA/RI INF	XCHANGER, ORMATION I	POSSIBLY RESU	JLTING IN			

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	MPS-100	MPS-1006 BASELINE [
	MPS 1006 GO2 PRE	SSURE ISOI	LATION CHI	ECK VALVE (CV18	, 19,		
LEAD ANALYST:	K.A. HO	LDEN						
ASSESSMENT:								
CRITICAL FLIGH		REDUNDANG	CY SCREENS	5	CIL	Ī		
HDW/FU	NC	A	В	С				
NASA [/ IOA [1 /1] [] [NA] [] [NA] [NA]	[x] *]		
COMPARE [N /N] [и][N] [N]	[N]		
RECOMMENDATIONS:	(If d	lifferent :	from NASA)				
[1 /1] [[NA]	NA] [NA]	[DD/DE] ELETE)		
* CIL RETENTION	RATIONAL	E: (If ap		ADEQUATE NADEQUATE	[]		
REMARKS: THE BURNING OF THIS VALVE COULD CAUSE A HOLE WHICH WOULD ALLOHOT GO2 TO ENTER THE AFT COMPARTMENT. THIS WOULD RESULT IN OVERPRESSURIZATION AND A POSSIBLE FIRE/EXPLOSION.								

					
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MCDONNELL DOUGLAS ASTRONAUTICS COMPANY –
ENGINEERING SERVICES
16055 SPACE CENTER BLVD, HOUSTON, TEXAS 77062